

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
	)	
Christophe Francois Guy GILBERT et al.	)	Group Art Unit: To Be Assigned
	)	
Application Number: To Be Assigned	)	Examiner: To Be Assigned
	)	
Filed: January 26, 2001	)	
	)	
For: STREPTOCOCCUS PNEUMONIAE PROTEINS AND NUCLEIC ACID MOLECULES	)	

SUBMISSION OF SEQUENCE LISTING

Commissioner for Patents  
Washington, D.C. 20231

Sir:

Applicants submit herewith a paper copy of the Sequence Listing as filed in parent application number PCT/GB99/02451 filed July 27, 1999. The Sequence Listing in this application is identical to the Sequence Listing submitted in the parent application.

Applicants respectfully submit that it is unnecessary to file a computer readable form of the Sequence Listing, since it would be a duplicate of the computer readable form submitted in parent application number PCT/GB99/02451. Therefore, in accordance with 37 C.F.R. §1.821(e), no computer readable form is enclosed.

Applicants herewith request that the computer readable form submitted in parent application number PCT/GB99/02451 be used in this application. The undersigned certifies his belief that the computer readable form submitted in the parent application is identical in content to the paper copy of the Sequence Listing enclosed herewith.

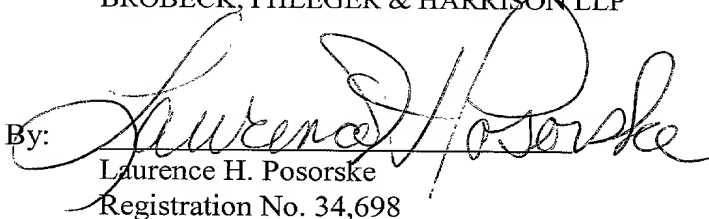
It is believed that no fees are required for this submission; however, the Commissioner is authorized to charge any fee necessary for entry of this paper to Deposit Account 50-1640.

Respectfully submitted,

BROBECK, PHLEGER & HARRISON LLP

January 26, 2001

By:

  
Laurence H. Posorske  
Registration No. 34,698

Brobeck, Phleger & Harrison LLP  
Intellectual Property Department  
1333 H Street, N.W., Suite 800  
Washington, D.C. 20005  
Tel: (202) 220-6000  
Fax: (202) 220-5200  
LHP:nej



## SEQUENCE LISTING

<110> Microbial Technics Limited  
 Gilbert, Christophe FG  
 Hansbro, Philip M

<120> Proteins

<130> PWC/P21129WO

<140> PCT/GB99/02451

<141> 1999-07-27

<150> GB 9816337.1

<151> 1998-03-27

<150> US 60/125164

<151> 1999-03-19

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Glu Lys Phe Ser Ala Lys Leu Gln Glu Gln Ile Gln Val Tyr Phe Gln

35

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45

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 65 70 75 80

Tyr Asn Asp Lys Glu Asp Ser Tyr Thr His Pro Asp Gly Trp Tyr Tyr  
 85 90 95

Arg Phe His His Thr Lys Tyr Gln Lys Thr Gln Thr Asp Phe Gln Gln  
 100 105 110

Glu Ile Lys Val Tyr Tyr Ala Asp Glu Pro Glu Ser Ala Pro Gln Lys  
 115 120 125

Gly Leu Tyr Met Asn Glu Arg Tyr Gln Asn Leu Lys Ala Lys Glu Cys  
 130 135 140

Gln Ala Leu Leu Ser Pro Gln Gly Arg Gln Ile Phe Ala Gln Arg Lys  
 145 150 155 160

Ile Asp Val Glu Pro Val Phe Gly Gln Ile Lys Ala Ser Leu Gly Tyr  
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Lys Arg Cys Asn Leu Arg Gly Lys Arg Gln Val Arg Ile Asp Met Gly  
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Leu Val Leu Met Ala Asn Asn Leu Leu Lys Tyr Ser Lys Met Lys  
 195 200 205

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&lt;210&gt; 2

&lt;211&gt; 2233

&lt;212&gt; PRT

&lt;213&gt; Streptococcus pneumoniae

&lt;400&gt; 2

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Phe Ala Val Gly Ala Cys Ser Val Met Ile Gly Thr Cys Ala Val Leu

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30

Leu Gly Gly Asn Ile Ala Gly Glu Ser Val Val Tyr Ala Asp Glu Thr

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40

45

Leu Ile Thr His Thr Ala Glu Lys Pro Lys Glu Glu Lys Met Ile Val

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Glu Glu Lys Ala Asp Lys Ala Leu Glu Thr Lys Asn Ile Val Glu Arg

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Thr Glu Gln Ser Glu Pro Ser Ser Thr Glu Ala Ile Ala Ser Glu Lys

85

90

95

Lys Glu Asp Glu Ala Val Thr Pro Lys Glu Glu Lys Val Ser Ala Lys

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105

110

Pro Glu Glu Lys Ala Pro Arg Ile Glu Ser Gln Ala Ser Asn Gln Glu

115

120

125

Lys Pro Leu Lys Glu Asp Ala Lys Ala Val Thr Asn Glu Glu Val Asn

130

135

140

Gln Met Ile Glu Asp Arg Lys Val Asp Phe Asn Gln Asn Trp Tyr Phe

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160

Lys Leu Asn Ala Asn Ser Lys Glu Ala Ile Lys Pro Asp Ala Asp Val

165

170

175

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995 1000 1005

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Pro Val Thr Trp Ser Ser Val Asp Val Ser Lys Pro Gly Ile Val Thr  
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Val Lys Gly Met Ala Asp Gly Arg Glu Val Glu Ala Arg Val Glu Val  
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Ile Ala Leu Lys Ser Glu Leu Pro Val Val Lys Arg Ile Ala Pro Asn  
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Thr Asp Leu Asn Ser Val Asp Lys Ser Val Ser Tyr Val Leu Ile Asp  
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Gly Ser Val Glu Glu Tyr Glu Val Asp Lys Trp Glu Ile Ala Glu Glu  
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Asp Lys Ala Lys Leu Ala Ile Pro Gly Ser Arg Ile Gln Ala Thr Gly  
1105 1110 1115 1120

Tyr Leu Glu Gly Gln Pro Ile His Ala Thr Leu Val Val Glu Glu Gly  
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Asn Pro Ala Ala Pro Ala Val Pro Thr Val Thr Val Gly Gly Glu Ala  
1140 1145 1150

Val Thr Gly Leu Thr Ser Gln Lys Pro Met Gln Tyr Arg Thr Leu Ala  
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Tyr Gly Ala Lys Leu Pro Glu Val Thr Ala Ser Ala Lys Asn Ala Ala  
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Val Thr Val Leu Gln Ala Ser Ala Ala Asn Gly Met Arg Ala Ser Ile  
1185 1190 1195 1200

Phe Ile Gln Pro Lys Asp Gly Gly Pro Leu Gln Thr Tyr Ala Ile Gln  
1205 1210 1215

1030 1035 1040 1045 1050 1055 1060 1065 1070 1075 1080 1085 1090 1095 1100 1105 1110 1115 1120 1125 1130 1135 1140 1145 1150 1155 1160 1165 1170 1175 1180 1185 1190 1195 1200 1205 1210 1215



Phe Leu Glu Glu Ala Pro Lys Ile Ala His Leu Ser Leu Gln Val Glu  
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Lys Ala Asp Ser Leu Lys Glu Asp Gln Thr Val Lys Leu Ser Val Arg  
 1235 1240 1245

Ala His Tyr Gln Asp Gly Thr Gln Ala Val Leu Pro Ala Asp Lys Val  
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Thr Phe Ser Thr Ser Gly Glu Gly Glu Val Ala Ile Arg Lys Gly Met  
 1265 1270 1275 1280

Leu Glu Leu His Lys Pro Gly Ala Val Thr Leu Asn Ala Glu Tyr Glu  
 1285 1290 1295

Gly Ala Lys Asp Gln Val Glu Leu Thr Ile Gln Ala Asn Thr Glu Lys  
 1300 1305 1310

Lys Ile Ala Gln Ser Ile Arg Pro Val Asn Val Val Thr Asp Leu His  
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Gln Glu Pro Ser Leu Pro Ala Thr Val Thr Val Glu Tyr Asp Lys Gly  
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Phe Pro Lys Thr His Lys Val Thr Trp Gln Ala Ile Pro Lys Glu Lys  
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Leu Asp Ser Tyr Gln Thr Phe Glu Val Leu Gly Lys Val Glu Gly Ile  
 1365 1370 1375

Asp Leu Glu Ala Arg Ala Lys Val Ser Val Glu Gly Ile Val Ser Val  
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Glu Glu Val Ser Val Thr Thr Pro Ile Ala Glu Ala Pro Gln Leu Pro  
 1395 1400 1405

Glu Ser Val Arg Thr Tyr Asp Ser Asn Gly His Val Ser Ser Ala Lys  
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009699 01500

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Phe Thr Val Asn Gly Arg Leu Glu Gly Thr Gln Leu Thr Thr Lys Leu  
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His Val Arg Val Ser Ala Gln Thr Glu Gln Gly Ala Asn Ile Ser Asp  
1460 1465 1470

Gln Trp Thr Gly Ser Glu Leu Pro Leu Ala Phe Ala Ser Asp Ser Asn  
1475 1480 1485

Pro Ser Asp Pro Val Ser Asn Val Asn Asp Lys Leu Ile Ser Tyr Asn  
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Asn Gln Pro Ala Asn Arg Trp Thr Asn Trp Asn Arg Thr Asn Pro Glu  
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Ala Ser Val Gly Val Leu Phe Gly Asp Ser Gly Ile Leu Ser Lys Arg  
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Ser Val Asp Asn Leu Ser Val Gly Phe His Glu Asp His Gly Val Gly  
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Val Pro Lys Ser Tyr Val Ile Glu Tyr Tyr Val Gly Lys Thr Val Pro  
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Thr Ala Pro Lys Asn Pro Ser Phe Val Gly Asn Glu Asp His Val Phe  
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Asn Asp Ser Ala Asn Trp Lys Pro Val Thr Asn Leu Lys Ala Pro Ala  
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Gln Leu Lys Ala Gly Glu Met Asn His Phe Ser Phe Asp Lys Val Glu  
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Thr Tyr Ala Val Arg Ile Arg Met Val Lys Ala Asp Asn Lys Arg Gly  
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Asp Glu Asn Ser Asn Gln Ala Phe Ala Ser Ala Thr Asn Asp Ile Asp  
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Lys Asn Ser His Asp Arg Val Asp Tyr Leu Asn Asp Gly Asp His Ser  
 1845 1850 1855

Glu Asn Arg Arg Trp Thr Asn Trp Ser Pro Thr Pro Ser Ser Asn Pro  
 1860 1865 1870

Glu Val Ser Ala Gly Val Ile Phe Arg Glu Asn Gly Lys Ile Val Glu  
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Arg Thr Val Thr Gln Gly Lys Val Gln Phe Phe Ala Asp Ser Gly Thr  
 1890 1895 1900

Asp Ala Pro Ser Lys Leu Val Leu Glu Arg Tyr Val Gly Pro Glu Phe  
 1905 1910 1915 1920

Glu Val Pro Thr Tyr Tyr Ser Asn Tyr Gln Ala Tyr Asp Ala Asp His  
 1925 1930 1935

Pro Phe Asn Asn Pro Glu Asn Trp Glu Ala Val Pro Tyr Arg Ala Asp  
 1940 1945 1950

Lys Asp Ile Ala Ala Gly Asp Glu Ile Asn Val Thr Phe Lys Ala Ile  
 1955 1960 1965

Lys Ala Lys Ala Met Arg Trp Arg Met Glu Arg Lys Ala Asp Lys Ser  
 1970 1975 1980

Gly Val Ala Met Ile Glu Met Thr Phe Leu Ala Pro Ser Glu Leu Pro  
 1985 1990 1995 2000

Gln Glu Ser Thr Gln Ser Lys Ile Leu Val Asp Gly Lys Glu Leu Ala  
 2005 2010 2015

Asp Phe Ala Glu Asn Arg Gln Asp Tyr Gln Ile Thr Tyr Lys Gly Gln  
 2020 2025 2030

Arg Pro Lys Val Ser Val Glu Glu Asn Asn Gln Val Ala Ser Thr Val  
 2035 2040 2045

0076927 23/09/2004

Val Asp Ser Gly Glu Asp Ser Phe Pro Val Leu Val Arg Leu Val Ser  
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Glu Ser Gly Lys Gln Val Lys Glu Tyr Arg Ile His Leu Thr Lys Glu  
 2065 2070 2075 2080

Lys Pro Val Ser Glu Lys Thr Val Ala Ala Val Gln Glu Asp Leu Pro  
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Lys Ile Glu Phe Val Glu Lys Asp Leu Ala Tyr Lys Thr Val Glu Lys  
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Lys Val Gly Lys Glu Arg Ile Phe Thr Ala Ile Asn Pro Asp Gly Ser  
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Lys Glu Glu Lys Leu Arg Glu Val Val Glu Val Pro Thr Asp Arg Ile  
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Val Leu Val Gly Thr Lys Pro Val Ala Gln Glu Ala Lys Lys Pro Gln  
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Val Ser Glu Lys Ala Asp Thr Lys Pro Ile Asp Ser Ser Glu Ala Ser  
 2180 2185 2190

Gln Thr Asn Lys Ala Gln Leu Pro Ser Thr Gly Ser Ala Ala Ser Gln  
 2195 2200 2205

Ala Ala Val Ala Ala Gly Leu Thr Leu Leu Gly Leu Ser Ala Gly Leu  
 2210 2215 2220

Val Val Thr Lys Gly Lys Lys Glu Asp  
 2225 2230

2050 2055 2060 2065 2070 2075 2080 2085 2090 2095 2100 2105 2110 2115 2120 2125 2130 2135 2140 2145 2150 2155 2160 2165 2170 2175 2180 2185 2190 2195 2200 2205 2210 2215 2220 2225 2230

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&lt;211&gt; 470

&lt;212&gt; PRT

&lt;213&gt; Streptococcus pneumoniae

&lt;400&gt; 3

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1

5

10

15

Cys Leu Phe Asn Asn Ser Val Thr Ala Gln Glu Ile Pro Lys Asn Leu

20

25

30

Asp Gly Asn Ile Thr His Thr Gln Thr Ser Glu Ser Phe Ser Glu Ser

35

40

45

Asp Glu Lys Gln Val Asp Tyr Ser Asn Lys Asn Gln Glu Glu Val Asp

50

55

60

Gln Asn Lys Phe Arg Ile Gln Ile Asp Lys Thr Glu Leu Phe Val Thr

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70

75

80

Thr Asp Lys His Leu Glu Lys Asn Cys Cys Lys Leu Glu Leu Glu Pro

85

90

95

Gln Ile Asn Asn Asp Ile Val Asn Ser Glu Ser Asn Asn Leu Leu Gly

100

105

110

Glu Asp Asn Leu Asp Asn Lys Ile Lys Glu Asn Val Ser His Leu Asp

115

120

125

Asn Arg Gly Gly Asn Ile Glu His Asp Lys Asp Asn Leu Glu Ser Ser

130

135

140

Ile Val Arg Lys Tyr Glu Trp Asp Ile Asp Lys Val Thr Gly Gly Gly

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150

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160

Glu Ser Tyr Lys Leu Tyr Ser Lys Ser Asn Ser Lys Val Ser Ile Ala

165

170

175

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Ile Leu Asp Ser Gly Val Asp Leu Gln Asn Thr Gly Leu Leu Lys Asn  
180 185 190

Leu Ser Asn His Ser Lys Asn Tyr Val Pro Asn Lys Gly Tyr Leu Gly  
195 200 205

Lys Glu Glu Gly Glu Glu Gly Ile Ile Ser Asp Ile Gln Asp Arg Leu  
210 215 220

Gly His Gly Thr Ala Val Val Ala Gln Ile Val Gly Asp Asp Asn Ile  
225 230 235 240

Asn Gly Val Asn Pro His Val Asn Ile Asn Val Tyr Arg Ile Phe Gly  
245 250 255

Lys Ser Ser Ala Ser Pro Asp Trp Ile Val Lys Ala Ile Phe Asp Ala  
260 265 270

Val Asp Asp Gly Asn Asp Ile Ile Asn Leu Ser Thr Gly Gln Tyr Leu  
275 280 285

Met Ile Asp Gly Glu Tyr Glu Asp Gly Thr Asn Asp Phe Glu Thr Phe  
290 295 300

Leu Lys Tyr Lys Lys Ala Ile Asp Tyr Ala Asn Gln Lys Gly Val Ile  
305 310 315 320

Ile Val Ala Ala Leu Gly Asn Asp Ser Leu Asn Val Ser Asn Gln Ser  
325 330 335

Asp Leu Leu Lys Leu Ile Ser Ser Arg Lys Lys Val Arg Lys Pro Gly  
340 345 350

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Gly Ile Asp Arg Leu Gly Asn Leu Ser Asp Phe Ser Asn Lys Gly Asp  
370 375 380

00769787 1013501

Ser Asp Ala Ile Tyr Ala Pro Ala Gly Ser Thr Leu Ser Leu Ser Glu  
385 390 395 400

Leu Gly Leu Asn Asn Phe Ile Asn Ala Glu Lys Tyr Lys Glu Asp Trp  
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Ile Phe Ser Ala Thr Leu Gly Gly Tyr Thr Tyr Leu Tyr Gly Asn Ser  
420 425 430

Phe Ala Ala Pro Lys Val Ser Gly Ala Ile Ala Met Ile Ile Asp Lys  
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Trp Lys Lys His Tyr Gln  
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<212> PRT

<213> Streptococcus pneumoniae

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Asn Thr Asn His Thr Gly Leu Tyr Val Ala Lys Glu Lys Gly Tyr Phe  
50 55 60

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Glu Leu Lys Glu Lys Arg Asp Phe Val Ile Glu Ser Gln Lys Tyr Leu  
 275 280 285

Ser Lys Glu Tyr Ala Ser Asp Lys Glu Lys Trp Gly Gln Phe Asp Ala  
 290 295 300

Ala Arg Trp Asn Ala Phe Tyr Lys Trp Asp Lys Glu Asn Gly Ile Leu  
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Met Ala Gly Val Thr Asn Ser Ala Phe Arg Thr Ile Ala Lys Glu Leu  
 35 40 45

Gly Ala Gly Leu Val Val Met Glu Met Val Ser Asp Lys Gly Ile Gln  
 50 55 60

Tyr Asn Asn Glu Lys Thr Leu His Met Leu His Ile Asp Glu Gly Glu  
 65 70 75 80

Asn Pro Val Ser Ile Gln Leu Phe Gly Ser Asp Glu Asp Ser Leu Ala  
 85 90 95

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Glu Asn Val Ala Val Arg Glu Phe Arg Gly Leu Ala Pro His Tyr Leu  
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Arg Gly Thr Ser Gly Ala Ala Lys Leu Arg Gly Ala Ile Ser Gln Ala  
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Ser Thr Leu Ala Glu Ile Glu Thr Leu Leu Gln Leu Glu Lys Ala  
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<212> PRT

<213> Streptococcus pneumoniae

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Thr Phe Pro Phe Tyr Tyr Ile Gln Leu Glu Gly Glu Lys Phe Asn Glu  
 35 40 45

Ser Ala Arg Val Phe Thr Glu Tyr Leu Lys Thr Lys Thr Ser Asp Glu  
 50 55 60

Ile Pro Ser Leu Leu Gln Ser Tyr Ser Lys Ser Leu Thr Ile Ser Ala  
 65 70 75 80

His Leu Lys Arg Asp Ile Val Asp Lys Arg Leu Pro Leu Val His Asp  
 85 90 95

Leu Asp Ile Lys Asp Gly Lys Leu Ser Asn Tyr Ile Val Met Leu Asp  
 100 105 110

Met Ser Val Ser Thr Ala Asp Gly Lys Gln Val Thr Val Gln Phe Val  
 115 120 125

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His Gly Val Asp Val Tyr Lys Glu Ala Lys Asn Ile Leu Leu Leu Tyr  
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Leu Pro Tyr Thr Phe Leu Val Thr Ile Ala Phe Ser Phe Val Phe Ser  
 145 150 155 160

Tyr Phe Tyr Thr Lys Arg Leu Leu Asn Pro Leu Phe Tyr Ile Ser Glu  
 165 170 175

Val Thr Ser Lys Met Gln Asp Leu Asp Asp Asn Ile Arg Phe Asp Glu  
 180 185 190

Ser Arg Lys Asp Glu Val Gly Glu Val Gly Lys Gln Ile Asn Gly Met  
 195 200 205

Tyr Glu His Leu Leu Lys Val Ile Tyr Glu Leu Glu Ser Arg Asn Glu  
 210 215 220

Gln Ile Val Lys Leu Gln Asn Gln Lys Val Ser Phe Val Arg Gly Ala  
 225 230 235 240

Ser His Glu Leu Lys Thr Pro Leu Ala Ser Leu Arg Ile Ile Leu Glu  
 245 250 255

Asn Met Gln His Asn Ile Gly Asp Tyr Lys Asp His Pro Lys Tyr Ile  
 260 265 270

Ala Lys Ser Ile Asn Lys Ile Asp Gln Met Ser His Leu Leu Glu Glu  
 275 280 285

Val Leu Glu Ser Ser Lys Phe Gln Glu Trp Thr Glu Cys Arg Glu Thr  
 290 295 300

Thr Val Lys Pro Val Leu Val Asp Ile Leu Ser Arg Tyr Gln Glu Leu  
 305 310 315 320

Ala His Ser Ile Gly Val Thr Ile Glu Asn Gln Leu Thr Asp Ala Thr  
 325 330 335

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35 40 45

Lys Val Pro Ser Phe Phe Ala Gly Gln His Ile Pro Leu Gly Val Glu  
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Lys Glu Gln Thr Pro Val Tyr Tyr Leu Lys Asn Asp Leu Asp Met Glu  
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<213> Streptococcus pneumoniae

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100                      105                      110

115                      120                      125

130                      135                      140

Lys Asp Gln Val Leu Glu Arg Gln Pro Asn Leu Lys Lys Glu Gly Leu  
145 150 155 160

Val Gly Gly Gly Val Tyr Leu Asp Phe Arg Asn Asn Asp Ala Arg Leu  
165 170 175

Val Ile Glu Asn Ile Lys Arg Ala Asn Gln Asp Gly Ala Leu Ile Ala  
180 185 190

Asn His Val Lys Ala Glu Gly Phe Leu Phe Asp Glu Ser Gly Lys Ile  
195 200 205

Thr Gly Val Val Ala Arg Asp Leu Leu Thr Asp Gln Val Phe Glu Ile  
210 215 220

Lys Ala Arg Leu Val Ile Asn Thr Thr Gly Pro Trp Ser Asp Lys Val  
225 230 235 240

Arg Asn Leu Ser Asn Lys Gly Thr Gln Phe Ser Gln Met Arg Pro Thr  
245 250 255

Lys Gly Val His Leu Val Val Asp Ser Ser Lys Ile Lys Val Ser Gln  
260 265 270

Pro Val Tyr Phe Asp Thr Gly Leu Gly Asp Gly Arg Met Val Phe Val  
275 280 285

Leu Pro Arg Glu Asn Lys Thr Tyr Phe Gly Thr Thr Asp Thr Asp Tyr  
290 295 300

Thr Gly Asp Leu Glu His Pro Lys Val Thr Gln Glu Asp Val Asp Tyr  
305 310 315 320

Leu Leu Gly Ile Val Asn Asn Arg Phe Pro Glu Ser Asn Ile Thr Ile  
325 330 335

Asp Asp Ile Glu Ser Ser Trp Ala Gly Leu Arg Pro Leu Ile Ala Gly  
340 345 350

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Asn Ser Ala Ser Asp Tyr Asn Gly Gly Asn Asn Gly Thr Ile Ser Asp  
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Glu Ser Phe Asp Asn Leu Ile Ala Thr Val Glu Ser Tyr Leu Ser Lys  
370 375 380

Glu Lys Thr Arg Glu Asp Val Glu Ser Ala Val Ser Lys Leu Glu Ser  
385 390 395 400

Ser Thr Ser Glu Lys His Leu Asp Pro Ser Ala Val Ser Arg Gly Ser  
405 410 415

Ser Leu Asp Arg Asp Asp Asn Gly Leu Leu Thr Leu Ala Gly Gly Lys  
420 425 430

Ile Thr Asp Tyr Arg Lys Met Ala Glu Gly Ala Met Glu Arg Val Val  
435 440 445

Asp Ile Leu Lys Ala Glu Phe Asp Arg Ser Phe Lys Leu Ile Asn Ser  
450 455 460

Lys Thr Tyr Pro Val Ser Gly Gly Glu Leu Asn Pro Ala Asn Val Asp  
465 470 475 480

Ser Glu Ile Glu Ala Phe Ala Gln Leu Gly Val Ser Arg Gly Leu Asp  
485 490 495

Ser Lys Glu Ala His Tyr Leu Ala Asn Leu Tyr Gly Ser Asn Ala Pro  
500 505 510

Lys Val Phe Ala Leu Ala His Ser Leu Glu Gln Ala Pro Gly Leu Ser  
515 520 525

Leu Ala Asp Thr Leu Ser Leu His Tyr Ala Met Arg Asn Glu Leu Thr  
530 535 540

Leu Ser Pro Val Asp Phe Leu Leu Arg Arg Thr Asn His Met Leu Phe  
545 550 555 560

103210 2826960

Ala Ser Val Leu Pro Tyr Ile Leu Ala Gln Phe Ala Gly Ala Met Leu  
85 90 95



30

Ile Leu Trp Leu Lys Trp Tyr Phe Met Arg Asp Lys Glu Gln Pro Lys  
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Tyr Ser Val Leu Glu Arg Lys Met Phe Asp Ala Ala Lys Asn Gln Asp  
35 40 45

Met Leu Ala Tyr Gln Lys Tyr Ala Thr Ile Lys Gln Ile Thr Asp Ile  
50 55 60

Arg Val Gln Thr Ser Glu Ala Asp Ile Leu Glu Ala Val Lys Glu Val  
65 70 75 80

Tyr Val Tyr Asn His Met Asn Val Ile Gly Ala Cys Gln Arg Ile Leu  
85 90 95

Phe Ile Ser Gln Ser Pro Ala Tyr Asp Lys Leu Asn Lys Trp Phe Asn  
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Ala Ala Gly Lys Arg Val Phe Tyr Ile Ala Pro Asn Ser Leu Ser Phe  
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Glu Lys Glu Arg Ala Val Leu Glu Tyr Leu Ser Gln Gln Ala Ser Phe  
 50 55 60

Ser Ile Thr Val Thr Arg Phe Ala Gln Met Ala Arg Tyr Leu Val Leu  
 65 70 75 80

Asn Asp Leu Pro Ala Lys Thr Thr Leu Asp Asp Ile Gly Leu Gly Leu  
 85 90 95

Ala Phe Tyr Lys Cys Leu Ala Glu Leu Asp Pro Lys Asp Leu Arg Val  
 100 105 110

Tyr Gly Ala Ile Lys Gln Asp Pro Gln Leu Ile Gln Gln Leu Ile Glu  
 115 120 125

Leu Tyr His Glu Met Thr Lys Ser Gln Met Ser Phe Leu Asp Leu Glu  
 130 135 140

Asn Leu Thr Asp Glu Asp Lys Arg Ala Asp Leu Leu Leu Ile Phe Glu  
 145 150 155 160

Lys Val Thr Ala Tyr Leu Asn Gln Gly Gln Leu Ala Gln Glu Ser Gln  
 165 170 175

Leu Ser His Leu Ile Glu Ala Ile Glu Asn Asp Lys Val Ser Ser Asp  
 180 185 190

Phe Asn Gln Ile Ala Leu Val Ile Asp Gly Phe Thr Arg Phe Ser Ala  
 195 200 205

Glu Glu Glu Arg Val Val Asp Leu Leu His Gly Lys Gly Val Glu Ile  
 210 215 220

Val Ile Gly Ala Tyr Ala Ser Lys Lys Ala Tyr Thr Ser Pro Phe Ser  
 225 230 235 240

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Glu Gly Asn Leu Tyr Gln Ala Ser Val Lys Phe Leu His His Leu Ala  
 245 250 255

Ser Lys Tyr Gln Thr Pro Ala Gln Asp Cys Ser Gln Thr His Glu Lys  
 260 265 270

Met Asp Ser Phe Asp Lys Ala Ser Arg Leu Leu Glu Ser Ser Tyr Asp  
 275 280 285

Phe Ser Glu Leu Ala Leu Asp Val Asp Glu Lys Asp Arg Glu Asn Leu  
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Gln Ile Trp Ser Cys Leu Thr Gln Lys Glu Glu Leu Glu Leu Val Ala  
 305 310 315 320

Arg Ser Ile Arg Gln Lys Leu His Glu Asn Ser Asp Leu Ser Tyr Lys  
 325 330 335

His Phe Arg Ile Leu Leu Gly Asp Val Ala Ser Tyr Gln Leu Ser Leu  
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Lys Thr Ile Phe Asp Gln Tyr Gln Ile Pro Phe Tyr Leu Gly Arg Ser  
 355 360 365

Glu Ala Met Ala His His Pro Leu Thr Gln Phe Val Glu Ser Ile Leu  
 370 375 380

Ala Leu Lys Arg Tyr Arg Phe Arg Gln Glu Asp Leu Ile Asn Leu Leu  
 385 390 395 400

Arg Thr Asp Leu Tyr Thr Asp Leu Ser Gln Ser Asp Ile Asp Ala Phe  
 405 410 415

Glu Gln Tyr Ile Arg Tyr Leu Gly Ile Asn Gly Leu Pro Ala Phe Gln  
 420 425 430

Gln Thr Phe Thr Lys Ser His His Gly Lys Phe Asn Leu Glu Arg Leu  
 435 440 445

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Pro Ser Leu Phe Asn Glu Ser Glu Ser Lys Glu Ser Ala Tyr Leu Gln  
645 650 655

Val Ala Arg Thr Thr Gly His Ile Leu Arg His Asn Pro Ala Ile Glu  
850 855 860

Thr Ile Lys Glu Glu Ala Asn Phe Gly Gly Lys Asp Gln Ala Phe Ile  
865 870 875 880

Gln Leu Asp Asn Gly Arg Ser Val Phe Val Arg Gly Lys Val Asp Arg  
885 890 895

Ile Asp Arg Leu Lys Ala Asn Gly Ala Ile Gly Val Val Asp Tyr Lys  
900 905 910

Ser Ser Leu Thr Gln Phe Gln Phe Pro His Phe Phe Asn Gly Leu Asn  
915 920 925

Ser Gln Leu Pro Thr Tyr Leu Ala Ala Leu Lys Arg Glu Gly Glu Gln  
930 935 940

Asn Phe Phe Gly Ala Met Tyr Leu Glu Met Ala Glu Pro Val Gln Ser  
945 950 955 960

Leu Met Ala Val Lys Ser Leu Ala Gly Ala Val Val Glu Ala Ser Lys  
965 970 975

Ser Met Lys Tyr Gln Gly Leu Phe Leu Glu Lys Glu Ser Ser Tyr Leu  
980 985 990

Gly Glu Phe Tyr Asn Lys Asn Lys Ala Asn Gln Leu Thr Asp Glu Glu  
995 1000 1005

Phe Gln Leu Leu Leu Asp Tyr Asn Ala Tyr Leu Tyr Lys Lys Ala Ala  
1010 1015 1020

Glu Lys Ile Leu Ala Gly Arg Phe Ala Ile Asn Pro Tyr Thr Glu Asn  
1025 1030 1035 1040

Gly Arg Ser Ile Ala Pro Tyr Val Gln Gln His Gln Ala Ile Thr Gly  
1045 1050 1055

Phe Glu Ala Asn Tyr His Leu Gly Gln Ala Arg Phe Leu Glu Lys Leu  
1060 1065 1070

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Asp Leu Ala Asp Gly Lys Arg Leu Val Gly Glu Lys Leu Lys Gln Ala

1075

1080

1085

Trp Leu Glu Lys Ile Arg Glu Glu Leu Asn Arg

1090

1095

&lt;210&gt; 12

&lt;211&gt; 1216

&lt;212&gt; PRT

&lt;213&gt; Streptococcus pneumoniae

&lt;400&gt; 12

Met Lys Leu Ile Pro Phe Leu Ser Glu Glu Glu Ile Gln Lys Leu Gln

1

5

10

15

Glu Ala Glu Ala Asn Ser Ser Lys Glu Gln Lys Lys Thr Ala Glu Gln

20

25

30

Ile Glu Ala Ile Tyr Thr Ser Ala Gln Asn Ile Leu Val Ser Ala Ser

35

40

45

Ala Gly Ser Gly Lys Thr Phe Val Met Ala Glu Arg Ile Leu Asp Gln

50

55

60

Leu Ala Arg Gly Val Glu Ile Ser Gln Leu Phe Ile Ser Thr Phe Thr

65

70

75

80

Val Lys Ala Ala Thr Glu Leu Lys Glu Arg Leu Glu Lys Lys Ile Ser

85

90

95

Lys Lys Ile Gln Glu Thr Asp Asp Val Asp Leu Lys Gln His Leu Gly

100

105

110

Arg Gln Leu Ala Asp Leu Pro Asn Ala Ala Ile Gly Thr Met Asp Ser

115

120

125

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Phe Thr Gln Lys Phe Leu Gly Lys His Gly Tyr Leu Leu Asp Ile Ala  
130 135 140

Pro Asn Phe Arg Ile Leu Gln Asn Gln Ser Glu Gln Leu Ile Leu Glu  
145 150 155 160

Asn Glu Val Phe His Glu Val Phe Glu Ala His Tyr Gln Gly Lys Gln  
165 170 175

Lys Glu Thr Phe Ser His Leu Leu Lys Asn Phe Ala Gly Arg Gly Lys  
180 185 190

Asp Glu Arg Gly Leu Arg Gln Gln Val Tyr Lys Ile Tyr Asp Phe Leu  
195 200 205

Gln Ser Thr Ser Asn Pro Gln Lys Trp Leu Ser Glu Ser Phe Leu Lys  
210 215 220

Gly Phe Glu Lys Ala Asp Phe Thr Ser Glu Lys Glu Lys Leu Thr Glu  
225 230 235 240

Gln Ile Lys Gln Ala Leu Trp Asp Leu Glu Ser Phe Phe Arg Tyr His  
245 250 255

Leu Asp Asn Asp Ala Lys Glu Phe Ala Lys Ala Ala Tyr Leu Glu Asn  
260 265 270

Val Gln Leu Ile Leu Asp Glu Ile Gly Ser Leu Asn Gln Glu Ser Asp  
275 280 285

Ser Gln Ala Tyr Gln Ala Val Leu Ala Arg Val Val Ala Ile Ser Lys  
290 295 300

Glu Lys Asn Gly Arg Ala Leu Thr Asn Ala Ser Arg Lys Ala Asp Leu  
305 310 315 320

Lys Pro Leu Ala Asp Ala Tyr Asn Glu Glu Arg Lys Thr Gln Phe Ala  
325 330 335

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Lys Leu Gly Gln Leu Ser Asp Gln Ile Ala Ile Leu Asp Tyr Gln Glu  
 340 345 350

Arg Tyr His Gly Asp Thr Trp Lys Leu Ala Lys Thr Phe Gln Ser Phe  
 355 360 365

Met Ser Asp Phe Val Glu Ala Tyr Arg Gln Arg Lys Arg Gln Glu Asn  
 370 375 380

Ala Phe Glu Phe Ala Asp Ile Ser His Tyr Thr Ile Glu Ile Leu Glu  
 385 390 395 400

Asn Phe Pro Gln Val Arg Glu Ser Tyr Gln Glu Arg Phe His Glu Val  
 405 410 415

Met Val Asp Glu Tyr Gln Asp Thr Asn His Ile Gln Glu Arg Met Leu  
 420 425 430

Glu Leu Leu Ser Asn Gly His Asn Arg Phe Met Val Gly Asp Ile Lys  
 435 440 445

Gln Ser Ile Tyr Arg Phe Arg Gln Ala Asp Pro Gln Ile Phe Asn Glu  
 450 455 460

Lys Phe Gln Arg Tyr Ala Gln Asn Pro Gln Glu Gly Arg Leu Ile Ile  
 465 470 475 480

Leu Lys Glu Asn Phe Arg Ser Ser Ser Glu Val Leu Ser Ala Thr Asn  
 485 490 495

Asp Val Phe Glu Arg Leu Met Asp Gln Glu Val Gly Glu Ile Asn Tyr  
 500 505 510

Asp Asn Lys His Gln Leu Val Phe Ala Asn Thr Lys Leu Thr Pro Asn  
 515 520 525

Pro Asp Asn Lys Ala Ala Phe Leu Leu Tyr Asp Lys Asp Asp Thr Gly  
 530 535 540

109210-26269260

Glu Glu Glu Glu Ser Gln Thr Glu Thr Lys Leu Thr Gly Glu Met Arg  
545 550 555 560

Leu Val Ile Lys Glu Ile Leu Lys Leu His Gln Glu Lys Gly Val Ala  
565 570 575

Phe Lys Glu Ile Ala Leu Leu Thr Ser Ser Arg Ser Arg Asn Asp Gln  
580 585 590

Ile Leu Leu Ala Leu Ser Glu Tyr Gly Ile Pro Val Lys Thr Asp Gly  
595 600 605

Glu Gln Asn Asn Tyr Leu Gln Ser Leu Glu Val Gln Val Met Leu Asp  
610 615 620

Thr Leu Arg Val Ile His Asn Pro Leu Gln Asp Tyr Ala Leu Val Ala  
625 630 635 640

Leu Met Lys Ser Pro Met Phe Gly Phe Asp Glu Asp Glu Leu Ala Arg  
645 650 655

Leu Ser Leu Gln Lys Ala Glu Asp Lys Val His Glu Asn Leu Tyr Glu  
660 665 670

Lys Leu Val Asn Ala Gln Lys Met Ala Ser Ser Gln Lys Gly Leu Ile  
675 680 685

His Thr Ala Leu Ala Glu Lys Leu Lys Gln Phe Met Asp Ile Leu Ala  
690 695 700

Ser Trp Arg Leu Tyr Ala Lys Thr His Ser Leu Tyr Asp Leu Ile Trp  
705 710 715 720

Lys Ile Tyr Asn Asp Arg Phe Tyr Tyr Asp Tyr Val Gly Ala Leu Pro  
725 730 735

Asn Gly Pro Ala Arg Gln Ala Asn Leu Tyr Ala Leu Ala Leu Arg Ala  
740 745 750

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Leu Asn Phe Ser Tyr Arg Phe Ile Gly Glu Asp Gln Leu Thr Arg Glu  
945                    950                    955                    960



Ala Ile Gly Glu Leu Glu Thr Lys Ser Pro Leu Gln Asp Ser Ser Gln  
 965 970 975

Ala Asp Asn Arg Gln Ser Asp Thr Ile Lys Glu Ala Leu Glu Met Leu  
 980 985 990

Lys Glu Val Glu Val Tyr Asn Thr Leu His Arg Ala Ala Ile Glu Leu  
 995 1000 1005

Pro Ser Val Gln Thr Pro Ser Gln Ile Lys Lys Phe Tyr Glu Pro Val  
 1010 1015 1020

Met Asp Met Glu Gly Val Glu Ile Ala Gly Gln Gly Gln Ser Val Gly  
 1025 1030 1035 1040

Lys Lys Ile Ser Phe Asp Leu Pro Asp Phe Ser Thr Lys Glu Lys Val  
 1045 1050 1055

Thr Gly Ala Glu Ile Gly Ser Ala Thr His Glu Leu Met Gln Arg Ile  
 1060 1065 1070

Asp Leu Ser Gln Gln Leu Thr Leu Ala Ser Leu Thr Glu Thr Leu Lys  
 1075 1080 1085

Gln Val Gln Thr Ser Gln Ala Val Arg Asp Lys Ile Asn Leu Asp Lys  
 1090 1095 1100

Ile Leu Ala Phe Phe Asp Thr Val Leu Gly Gln Glu Ile Leu Ala Asn  
 1105 1110 1115 1120

Thr Asp His Leu Tyr Arg Glu Gln Pro Phe Ser Met Leu Lys Arg Asp  
 1125 1130 1135

Gln Lys Ser Gln Glu Asp Phe Val Val Arg Gly Ile Leu Asp Gly Tyr  
 1140 1145 1150

Leu Leu Tyr Glu Asn Lys Ile Val Leu Phe Asp Tyr Lys Thr Asp Arg  
 1155 1160 1165

1099-1098-1097-1096-1095-1094-1093-1092-1091-1090-1089-1088-1087-1086-1085-1084-1083-1082-1081-1080-1079-1078-1077-1076-1075-1074-1073-1072-1071-1070-1069-1068-1067-1066-1065-1064-1063-1062-1061-1060-1059-1058-1057-1056-1055-1054-1053-1052-1051-1050-1049-1048-1047-1046-1045-1044-1043-1042-1041-1040-1039-1038-1037-1036-1035-1034-1033-1032-1031-1030-1029-1028-1027-1026-1025-1024-1023-1022-1021-1020-1019-1018-1017-1016-1015-1014-1013-1012-1011-1010-1009-1008-1007-1006-1005-1004-1003-1002-1001-1000-999-998-997-996-995-994-993-992-991-990-989-988-987-986-985-984-983-982-981-980-979-978-977-976-975-974-973-972-971-970-969-968-967-966-965-964-963-962-961-960-959-958-957-956-955-954-953-952-951-950-949-948-947-946-945-944-943-942-941-940-939-938-937-936-935-934-933-932-931-930-929-928-927-926-925-924-923-922-921-920-919-918-917-916-915-914-913-912-911-910-909-908-907-906-905-904-903-902-901-900-899-898-897-896-895-894-893-892-891-890-889-888-887-886-885-884-883-882-881-880-879-878-877-876-875-874-873-872-871-870-869-868-867-866-865-864-863-862-861-860-859-858-857-856-855-854-853-852-851-850-849-848-847-846-845-844-843-842-841-840-839-838-837-836-835-834-833-832-831-830-829-828-827-826-825-824-823-822-821-820-819-818-817-816-815-814-813-812-811-810-809-808-807-806-805-804-803-802-801-800-799-798-797-796-795-794-793-792-791-790-789-788-787-786-785-784-783-782-781-780-779-778-777-776-775-774-773-772-771-770-769-768-767-766-765-764-763-762-761-760-759-758-757-756-755-754-753-752-751-750-749-748-747-746-745-744-743-742-741-740-739-738-737-736-735-734-733-732-731-730-729-728-727-726-725-724-723-722-721-720-719-718-717-716-715-714-713-712-711-710-709-708-707-706-705-704-703-702-701-700-699-698-697-696-695-694-693-692-691-690-689-688-687-686-685-684-683-682-681-680-679-678-677-676-675-674-673-672-671-670-669-668-667-666-665-664-663-662-661-660-659-658-657-656-655-654-653-652-651-650-649-648-647-646-645-644-643-642-641-640-639-638-637-636-635-634-633-632-631-630-629-628-627-626-625-624-623-622-621-620-619-618-617-616-615-614-613-612-611-610-609-608-607-606-605-604-603-602-601-600-599-598-597-596-595-594-593-592-591-590-589-588-587-586-585-584-583-582-581-580-579-578-577-576-575-574-573-572-571-570-569-568-567-566-565-564-563-562-561-560-559-558-557-556-555-554-553-552-551-550-549-548-547-546-545-544-543-542-541-540-539-538-537-536-535-534-533-532-531-530-529-528-527-526-525-524-523-522-521-520-519-518-517-516-515-514-513-512-511-510-509-508-507-506-505-504-503-502-501-500-499-498-497-496-495-494-493-492-491-490-489-488-487-486-485-484-483-482-481-480-479-478-477-476-475-474-473-472-471-470-469-468-467-466-465-464-463-462-461-460-459-458-457-456-455-454-453-452-451-450-449-448-447-446-445-444-443-442-441-440-439-438-437-436-435-434-433-432-431-430-429-428-427-426-425-424-423-422-421-420-419-418-417-416-415-414-413-412-411-410-409-408-407-406-405-404-403-402-401-400-399-398-397-396-395-394-393-392-391-390-389-388-387-386-385-384-383-382-381-380-379-378-377-376-375-374-373-372-371-370-369-368-367-366-365-364-363-362-361-360-359-358-357-356-355-354-353-352-351-350-349-348-347-346-345-344-343-342-341-340-339-338-337-336-335-334-333-332-331-330-329-328-327-326-325-324-323-322-321-320-319-318-317-316-315-314-313-312-311-310-309-308-307-306-305-304-303-302-301-300-299-298-297-296-295-294-293-292-291-290-289-288-287-286-285-284-283-282-281-280-279-278-277-276-275-274-273-272-271-270-269-268-267-266-265-264-263-262-261-260-259-258-257-256-255-254-253-252-251-250-249-248-247-246-245-244-243-242-241-240-239-238-237-236-235-234-233-232-231-230-229-228-227-226-225-224-223-222-221-220-219-218-217-216-215-214-213-212-211-210-209-208-207-206-205-204-203-202-201-200-199-198-197-196-195-194-193-192-191-190-189-188-187-186-185-184-183-182-181-180-179-178-177-176-175-174-173-172-171-170-169-168-167-166-165-164-163-162-161-160-159-158-157-156-155-154-153-152-151-150-149-148-147-146-145-144-143-142-141-140-139-138-137-136-135-134-133-132-131-130-129-128-127-126-125-124-123-122-121-120-119-118-117-116-115-114-113-112-111-110-109-108-107-106-105-104-103-102-101-100-99-98-97-96-95-94-93-92-91-90-89-88-87-86-85-84-83-82-81-80-79-78-77-76-75-74-73-72-71-70-69-68-67-66-65-64-63-62-61-60-59-58-57-56-55-54-53-52-51-50-49-48-47-46-45-44-43-42-41-40-39-38-37-36-35-34-33-32-31-30-29-28-27-26-25-24-23-22-21-20-19-18-17-16-15-14-13-12-11-10-9-8-7-6-5-4-3-2-1-0

Met Pro Val Gln Asp Ile Gln Thr Phe Val Ser Leu Gly Gly Glu Asp  
85 90 95

43

His Ile Val Phe Asn Gly Pro Asp Glu Gln Phe Leu Gly Gly Arg Leu  
100 105 110

Met Gly Ala Arg Ala Gly Ile Gly Gly Thr Tyr Gly Ala Met Pro Glu  
115 120 125

Leu Phe Leu Lys Leu Asn Gln Leu Ile Ala Asp Lys Asp Leu Glu Thr  
130 135 140

Ala Arg Glu Leu Gln Tyr Ala Ile Asn Ala Ile Ile Gly Lys Leu Thr  
145 150 155 160

Ser Ala His Gly Asn Met Tyr Gly Val Ile Lys Glu Val Leu Lys Ile  
165 170 175

Asn Glu Gly Leu Asn Ile Gly Ser Val Arg Ser Pro Leu Thr Pro Val  
180 185 190

Thr Glu Glu Asp Arg Pro Val Val Glu Ala Ala Ala Ala Leu Ile Arg  
195 200 205

Glu Thr Lys Glu Arg Phe Leu  
210 215

<210> 14

<211> 407

<212> PRT

<213> Streptococcus pneumoniae

<400> 14

Met Tyr Lys Thr Lys Cys Leu Arg Glu Lys Leu Val Leu Phe Leu Lys  
1 5 10 15

Ile Phe Phe Pro Ile Leu Ile Tyr Gln Phe Ala Asn Tyr Ser Ala Ser  
20 25 30

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Phe Val Asp Thr Ala Met Thr Gly Gln Tyr Asn Thr Met Asp Leu Ala  
 35 40 45

Gly Val Ser Met Ala Thr Ser Ile Trp Asn Pro Phe Phe Thr Phe Leu  
 50 55 60

Thr Gly Ile Val Ser Ala Leu Val Pro Ile Ile Gly His His Leu Gly  
 65 70 75 80

Arg Gly Lys Lys Glu Glu Val Ala Ser Asp Phe Tyr Gln Phe Ile Tyr  
 85 90 95

Leu Ala Leu Gly Leu Ser Val Val Leu Leu Gly Met Val Leu Phe Leu  
 100 105 110

Ala Pro Ile Ile Leu Asn His Ile Gly Leu Glu Ala Ala Val Ala Ala  
 115 120 125

Val Ala Val Arg Tyr Leu Trp Phe Leu Ser Ile Gly Ile Ile Pro Leu  
 130 135 140

Leu Leu Phe Ser Val Ile Arg Ser Leu Leu Asp Ser Leu Gly Leu Thr  
 145 150 155 160

Lys Leu Ser Met Tyr Leu Met Leu Leu Leu Leu Pro Leu Asn Ser Gly  
 165 170 175

Phe Asn Tyr Leu Leu Ile Tyr Gly Ala Phe Gly Val Pro Glu Leu Gly  
 180 185 190

Gly Ala Gly Ala Gly Leu Gly Thr Ser Leu Ala Tyr Trp Val Leu Leu  
 195 200 205

Gly Ile Ser Val Leu Val Leu Phe Lys Gln Glu Lys Leu Lys Ala Leu  
 210 215 220

His Leu Glu Lys Arg Ile Pro Leu Asn Met Asp Lys Ile Lys Glu Gly  
 225 230 235 240

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45

Val Arg Leu Gly Leu Pro Ile Gly Gly Thr Val Phe Ala Glu Val Ala  
245 250 255

Ile Phe Ser Val Val Gly Leu Ile Met Ala Lys Phe Ser Pro Leu Ile  
260 265 270

Ile Ala Ser His Gln Ser Ala Met Asn Phe Ser Ser Leu Met Tyr Ala  
275 280 285

Phe Pro Met Ser Ile Ser Ser Ala Met Ala Ile Val Val Ser Tyr Glu  
290 295 300

Val Gly Ala Lys Arg Phe Asp Asp Ala Lys Thr Tyr Ile Gly Leu Gly  
305 310 315 320

Arg Trp Thr Ala Leu Ile Phe Ala Ala Phe Thr Leu Thr Phe Leu Tyr  
325 330 335

Ile Phe Arg Gly Asn Val Ala Ser Leu Tyr Gly Asn Asp Pro Lys Phe  
340 345 350

Ile Asp Leu Thr Val Arg Phe Leu Thr Tyr Ser Leu Phe Phe Gln Leu  
355 360 365

Ala Asp Thr Phe Ala Ala Pro Leu Gln Gly Ile Leu Arg Gly Tyr Lys  
370 375 380

Asp Thr Val Ile Pro Phe Tyr Leu Gly Leu Leu Gly Tyr Trp Gly Val  
385 390 395 400

Ala Ile Pro Val Tyr Ala Ile  
405

<213> Streptococcus pneumoniae

Met Ser Thr Leu Ala Lys Ile Glu Ala Leu Leu Phe Val Ala Gly Glu

**1                      5                      10                      15**

Asp Gly Ile Arg Val Arg Gln Leu Ala Glu Leu Leu Ser Leu Pro Pro

20                      25                      30

Thr Gly Ile Gln Gln Ser Leu Gly Lys Leu Ala Gln Lys Tyr Glu Lys

**35                      40                      45**

Asp Pro Asp Ser Ser Leu Ala Leu Ile Glu Thr Ser Gly Ala Tyr Arg

**50**

Leu Val Thr Lys Pro Gln Phe Ala Glu Ile Leu Lys Glu Tyr Ser Lys

65                      70                      75                      80

Ala Pro Ile Asn Gln Ser Leu Ser Arg Ala Ala Leu Glu Thr Leu Ser

**85                      90                      95**

Ile Ile Ala Tyr Lys Gln Pro Ile Thr Arg Ile Glu Ile Asp Ala Ile

100                      105                      110

Arg Gly Val Asn Ser Ser Gly Ala Leu Ala Lys Leu Gln Ala Phe Asp

115                      120                      125

Leu Ile Lys Glu Asp Gly Lys Lys Glu Val Leu Gly Arg Pro Asn Leu

130                      135                      140

Tyr Val Thr Thr Asp Tyr Phe Leu Asp Tyr Met Gly Ile Asn His Leu

145                      150                      155                      160

Glu Glu Leu Pro Val Ile Asp Glu Leu Glu Ile Gln Ala Gln Glu Ser

165                      170                      175

Gln Leu Phe Gly Glu Arg Ile Glu Glu Asp Glu Asn Gln  
 180 185

<210> 16

<211> 311

<212> PRT

<213> Streptococcus pneumoniae

<400> 16

Met Asp Thr Met Ile Ser Arg Phe Phe Arg His Leu Phe Glu Ala Leu  
 1 5 10 15

Lys Ser Leu Lys Arg Asn Gly Trp Met Thr Val Ala Ala Val Ser Ser  
 20 25 30

Val Met Ile Thr Leu Thr Leu Val Ala Ile Phe Ala Ser Val Ile Phe  
 35 40 45

Asn Thr Ala Lys Leu Ala Thr Asp Ile Glu Asn Asn Val Arg Val Val  
 50 55 60

Val Tyr Ile Arg Lys Asp Val Glu Asp Asn Ser Gln Thr Ile Glu Lys  
 65 70 75 80

Glu Gly Gln Thr Val Thr Asn Asn Asp Tyr His Lys Val Tyr Asp Ser  
 85 90 95

Leu Lys Asn Met Ser Thr Val Lys Ser Val Thr Phe Ser Ser Lys Glu  
 100 105 110

Glu Gln Tyr Glu Lys Leu Thr Glu Ile Met Gly Asp Asn Trp Lys Ile  
 115 120 125

Phe Glu Gly Asp Ala Asn Pro Leu Tyr Asp Ala Tyr Ile Val Glu Ala  
 130 135 140

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48

Asn Thr Pro Asn Asp Val Lys Thr Ile Ala Glu Asp Ala Lys Lys Ile  
145 150 155 160

Glu Gly Val Ser Glu Val Gln Asp Gly Gly Ala Asn Thr Glu Arg Leu  
165 170 175

Phe Lys Leu Ala Ser Phe Ile Arg Val Trp Gly Leu Gly Ile Ala Ala  
180 185 190

Leu Leu Ile Phe Ile Ala Val Phe Leu Ile Ser Asn Thr Ile Arg Ile  
195 200 205

Thr Ile Ile Ser Arg Ser Arg Glu Ile Gln Ile Met Arg Leu Val Gly  
210 215 220

Ala Lys Asn Ser Tyr Ile Arg Gly Pro Phe Leu Leu Glu Gly Ala Phe  
225 230 235 240

Ile Gly Leu Leu Gly Ala Ile Ala Pro Ser Val Leu Val Phe Ile Val  
245 250 255

Tyr Gln Ile Val Tyr Gln Ser Val Asn Lys Ser Leu Val Gly Gln Asn  
260 265 270

Leu Ser Met Ile Ser Pro Asp Leu Phe Ser Pro Leu Met Ile Ala Leu  
275 280 285

Leu Phe Val Ile Gly Val Phe Ile Gly Ser Leu Gly Ser Gly Ile Ser  
290 295 300

Met Arg Arg Phe Leu Lys Ile  
305 310



&lt;210&gt; 17

&lt;211&gt; 658

&lt;212&gt; PRT

&lt;213&gt; Streptococcus pneumoniae

&lt;400&gt; 17

Met Lys Lys Val Arg Phe Ile Phe Leu Ala Leu Leu Phe Phe Leu Ala

1

5

10

15

Ser Pro Glu Gly Ala Met Ala Ser Asp Gly Thr Trp Gln Gly Lys Gln

20

25

30

Tyr Leu Lys Glu Asp Gly Ser Gln Ala Ala Asn Glu Trp Val Phe Asp

35

40

45

Thr His Tyr Gln Ser Trp Phe Tyr Ile Lys Ala Asp Ala Asn Tyr Ala

50

55

60

Glu Asn Glu Trp Leu Lys Gln Gly Asp Asp Tyr Phe Tyr Leu Lys Ser

65

70

75

80

Gly Gly Tyr Met Ala Lys Ser Glu Trp Val Glu Asp Lys Gly Ala Phe

85

90

95

Tyr Tyr Leu Asp Gln Asp Gly Lys Met Lys Arg Asn Ala Trp Val Gly

100

105

110

Thr Ser Tyr Val Gly Ala Thr Gly Ala Lys Val Ile Glu Asp Trp Val

115

120

125

Tyr Asp Ser Gln Tyr Asp Ala Trp Phe Tyr Ile Lys Ala Asp Gly Gln

130

135

140

His Ala Glu Lys Glu Trp Leu Gln Ile Lys Gly Lys Asp Tyr Tyr Phe

145

150

155

160

Lys Ser Gly Gly Tyr Leu Leu Thr Ser Gln Trp Ile Asn Gln Ala Tyr

165

170

175

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Val Asn Ala Ser Gly Ala Lys Val Gln Gln Gly Trp Leu Phe Asp Lys  
180 185 190

Gln Tyr Gln Ser Trp Phe Tyr Ile Lys Glu Asn Gly Asn Tyr Ala Asp  
195 200 205

Lys Glu Trp Ile Phe Glu Asn Gly His Tyr Tyr Tyr Leu Lys Ser Gly  
210 215 220

Gly Tyr Met Ala Ala Asn Glu Trp Ile Trp Asp Lys Glu Ser Trp Phe  
225 230 235 240

Tyr Leu Lys Phe Asp Gly Lys Met Ala Glu Lys Glu Trp Val Tyr Asp  
245 250 255

Ser His Ser Gln Ala Trp Tyr Tyr Phe Lys Ser Gly Gly Tyr Met Thr  
260 265 270

Ala Asn Glu Trp Ile Trp Asp Lys Glu Ser Trp Phe Tyr Leu Lys Ser  
275 280 285

Asp Gly Lys Ile Ala Glu Lys Glu Trp Val Tyr Asp Ser His Ser Gln  
290 295 300

Ala Trp Tyr Tyr Phe Lys Ser Gly Gly Tyr Met Thr Ala Asn Glu Trp  
305 310 315 320

Ile Trp Asp Lys Glu Ser Trp Phe Tyr Leu Lys Ser Asp Gly Lys Ile  
325 330 335

Ala Glu Lys Glu Trp Val Tyr Asp Ser His Ser Gln Ala Trp Tyr Tyr  
340 345 350

Phe Lys Ser Gly Gly Tyr Met Ala Lys Asn Glu Thr Val Asp Gly Tyr  
355 360 365

Gln Leu Gly Ser Asp Gly Lys Trp Leu Gly Gly Lys Thr Thr Asn Glu  
370 375 380

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Ala Lys Thr Phe Asp Asp Val Asp Lys Gly Ile Leu Gly Ala Thr Lys  
595 600 605

Trp Ile Lys Glu Asn Tyr Ile Asp Arg Gly Arg Thr Phe Leu Gly Asn  
610 615 620

Lys Ala Ser Gly Met Asn Val Glu Tyr Ala Ser Asp Pro Tyr Trp Gly  
625 630 635 640

Glu Lys Ile Ala Ser Val Met Met Lys Ile Asn Glu Lys Leu Gly Gly  
645 650 655

Lys Asp

<210> 18

<211> 288

<212> PRT

<213> Streptococcus pneumoniae

<400> 18

Met Lys Lys Val Leu Gln Lys Tyr Trp Ala Trp Ala Phe Val Val Ile  
1 5 10 15

Pro Leu Leu Leu Gln Ala Ile Phe Phe Tyr Val Pro Met Phe Gln Gly  
20 25 30

Ala Phe Tyr Ser Phe Thr Asn Trp Thr Gly Leu Thr Tyr Asn Tyr Lys  
35 40 45

Phe Val Gly Leu Asn Asn Phe Lys Leu Leu Phe Met Asp Pro Lys Phe  
50 55 60

Met Asn Ala Ile Gly Phe Thr Ala Ile Ile Ala Ile Ala Met Val Val  
65 70 75 80

Gly Glu Ile Ala Leu Gly Ile Phe Ile Ala Arg Val Leu Asn Ser Lys  
85 90 95

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&lt;210&gt; 19

&lt;211&gt; 278

&lt;212&gt; PRT

&lt;213&gt; Streptococcus pneumoniae

&lt;400&gt; 19

Met Met Lys Gln Asp Glu Arg Lys Ala Leu Ile Gly Lys Tyr Ile Leu  
 1 5 10 15

Leu Ile Leu Gly Ser Val Leu Ile Leu Val Pro Leu Leu Ala Thr Leu  
 20 25 30

Phe Ser Ser Phe Lys Pro Thr Lys Asp Ile Val Asp Asn Phe Phe Gly  
 35 40 45

Phe Pro Thr Asn Phe Thr Trp Asp Asn Phe Ser Arg Leu Leu Ala Asp  
 50 55 60

Gly Ile Gly Gly Tyr Tyr Trp Asn Ser Val Val Ile Thr Val Leu Ser  
 65 70 75 80

Leu Leu Ala Val Met Ile Phe Ile Pro Met Ala Ala Tyr Ser Ile Ala  
 85 90 95

Arg Asn Met Ser Lys Arg Lys Ala Phe Thr Ile Met Tyr Thr Leu Leu  
 100 105 110

Ile Leu Gly Ile Phe Val Pro Phe Gln Val Ile Met Ile Pro Ile Thr  
 115 120 125

Val Met Met Ser Lys Leu Gly Leu Ala Asn Thr Phe Gly Leu Ile Leu  
 130 135 140

Leu Tyr Leu Thr Tyr Ala Ile Pro Gln Thr Leu Phe Leu Tyr Val Gly  
 145 150 155 160

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 103650 20269260

55

Tyr Ile Lys Ile Ser Ile Pro Glu Ser Leu Asp Glu Ala Ala Glu Ile  
165 170 175

Asp Gly Ala Asn Gln Phe Thr Thr Tyr Phe Arg Ile Ile Phe Pro Met  
180 185 190

Met Lys Pro Met His Ala Thr Thr Met Ile Ile Asn Ala Leu Trp Phe  
195 200 205

Trp Asn Asp Phe Met Leu Pro Leu Leu Val Leu Asn Arg Asp Ser Lys  
210 215 220

Met Trp Thr Leu Pro Leu Phe Gln Tyr Asn Tyr Ala Gly Gln Tyr Phe  
225 230 235 240

Asn Asp Tyr Gly Pro Ser Phe Ala Ser Tyr Val Val Gly Ile Ile Ser  
245 250 255

Ile Thr Ile Val Tyr Leu Phe Phe Gln Arg His Ile Ile Ser Gly Met  
260 265 270

Ser Asn Gly Ala Val Lys  
275

<210> 20

<211> 347

<212> PRT

<213> Streptococcus pneumoniae

<400> 20

Met Lys Ser Ile Leu Gln Lys Met Gly Glu His Pro Met Leu Leu Leu  
1 5 10 15

Phe Leu Ser Tyr Ser Thr Val Ile Ser Ile Leu Ala Gln Asn Trp Met  
20 25 30

Gly Leu Val Ala Ser Val Gly Met Phe Leu Phe Thr Ile Phe Phe Leu  
 35 40 45

His Tyr Gln Ser Ile Leu Ser His Lys Phe Phe Arg Leu Ile Leu Gln  
 50 55 60

Phe Val Leu Phe Gly Ser Val Leu Ser Ala Ala Phe Ala Ser Leu Glu  
 65 70 75 80

His Phe Gln Ile Val Lys Lys Phe Asn Tyr Ala Phe Leu Ser Pro Asn  
 85 90 95

Met Gln Val Trp His Gln Asn Arg Ala Glu Val Thr Phe Phe Asn Pro  
 100 105 110

Asn Tyr Tyr Gly Ile Ile Cys Cys Phe Cys Ile Met Ile Ala Phe Tyr  
 115 120 125

Leu Phe Thr Thr Thr Lys Leu Asn Trp Leu Lys Val Phe Cys Val Ile  
 130 135 140

Ala Gly Phe Val Asn Leu Phe Gly Leu Asn Phe Thr Gln Asn Arg Thr  
 145 150 155 160

Ala Phe Pro Ala Ile Ile Ala Gly Ala Ile Ile Tyr Leu Phe Thr Thr  
 165 170 175

Ile Lys Asn Trp Lys Ala Phe Trp Leu Ser Ile Gly Val Phe Ala Ile  
 180 185 190

Gly Leu Ser Phe Leu Phe Ser Ser Asp Leu Gly Val Arg Met Gly Thr  
 195 200 205

Leu Asp Ser Ser Met Glu Glu Arg Ile Ser Ile Trp Asp Ala Gly Met  
 210 215 220

Ala Leu Phe Lys Gln Asn Pro Phe Trp Gly Glu Gly Pro Leu Thr Tyr  
 225 230 235 240

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Glu His Arg Met Leu Val Ser Asp Met Thr Asp  
340 345

<210> 21

<211> 432

<212> PRT

<213> Streptococcus pneumoniae

<400> 21

Met Ser Lys Met Asp Val Gln Lys Ile Ile Ala Pro Met Met Lys Phe  
1. 5 10 15

Val Asn Met Arg Gly Ile Ile Ala Leu Lys Asp Gly Met Leu Ala Ile  
20 25 30

Leu Pro Leu Thr Val Val Gly Ser Leu Phe Leu Ile Met Gly Gln Leu  
35 40 45

Trp Trp Phe Gly Val His Gly Gln Ser Val Val Asn Gly Val Val Thr  
245 250 255

Ala Leu Leu Leu Ser Asn Leu Asp Ala Asn Lys Ala Met Leu Ala Ser  
 260 265 270

Ala Asn Leu Ser Leu Glu Asn Gly Ala His Ile Val Thr Gln Gln Phe  
 275 280 285

Leu Asp Ser Phe Leu Ile Leu Ser Gly Ser Gly Ile Thr Phe Gly Leu  
 290 295 300

Val Val Ala Met Leu Phe Ala Ala Lys Ser Lys Gln Tyr Gln Ala Leu  
 305 310 315 320

Gly Lys Val Ala Ala Phe Pro Ala Ile Phe Asn Val Asn Glu Pro Val  
 325 330 335

Val Phe Gly Phe Pro Ile Val Met Asn Pro Val Met Phe Val Pro Phe  
 340 345 350

Ile Leu Val Pro Val Leu Ala Ala Val Ile Val Tyr Gly Ala Ile Ala  
 355 360 365

Thr Gly Phe Met Gln Pro Phe Ser Gly Val Thr Leu Pro Trp Ser Thr  
 370 375 380

Pro Ala Ile Leu Ser Gly Phe Leu Val Gly Gly Trp Gln Gly Val Ile  
 385 390 395 400

Thr Gln Leu Val Ile Leu Ala Met Ser Thr Leu Val Tyr Phe Pro Phe  
 405 410 415

Phe Lys Val Gln Asp Arg Leu Ala Tyr Gln Asn Glu Ile Lys Gln Ser  
 420 425 430

003210 032600

60

<210> 22

<211> 100

<212> PRT

<213> Streptococcus pneumoniae

<400> 22

Met Lys Lys Lys Asp Leu Val Asp Gln Leu Val Ser Glu Ile Glu Thr

1

5

10

15

Gly Lys Val Arg Thr Leu Gly Ile Tyr Gly His Gly Ala Ser Gly Lys

20

25

30

Ser Thr Phe Ala Gln Glu Leu Tyr Gln Ala Leu Asp Ser Thr Thr Val

35

40

45

Asn Leu Leu Glu Thr Asp Pro Tyr Ile Thr Ser Gly Arg His Leu Val

50

55

60

Val Pro Lys Asp Ala Pro Asn Gln Lys Val Thr Ala Ser Leu Pro Val

65

70

75

80

Ala His Glu Leu Glu Ser Leu Gln Arg Asp Ile Leu Ala Cys Arg Arg

85

90

95

Val Trp Met Ser

100

<210> 23

<211> 238

<212> PRT

<213> Streptococcus pneumoniae

<400> 23

Met Lys Lys Arg Tyr Leu Val Leu Thr Ala Leu Leu Ala Leu Ser Leu

1

5

10

15

Arg Tyr Val Gly Lys Glu Ala Lys Glu Ile Ala Ala Ser Gly Leu Ser  
210 215 220

Leu Glu Glu Tyr Tyr Gly Phe Glu Gly Gly Asp Tyr Val Asp  
 225 230 235

<210> 24

<211> 425

<212> PRT

<213> Streptococcus pneumoniae

<400> 24

Met Arg Glu Pro Asp Phe Leu Asn His Phe Leu Lys Lys Gly Tyr Phe  
 1 5 10 15

Lys Lys His Ala Lys Ala Val Leu Ala Leu Ser Gly Gly Leu Asp Ser  
 20 25 30

Met Phe Leu Phe Lys Val Leu Ser Thr Tyr Gln Lys Glu Leu Glu Ile  
 35 40 45

Glu Leu Ile Leu Ala His Val Asn His Lys Gln Arg Ile Glu Ser Asp  
 50 55 60

Trp Glu Glu Lys Glu Leu Arg Lys Leu Ala Ala Glu Ala Glu Leu Pro  
 65 70 75 80

Ile Tyr Ile Ser Asn Phe Ser Gly Glu Phe Ser Glu Ala Arg Ala Arg  
 85 90 95

Asn Phe Arg Tyr Asp Phe Phe Gln Glu Val Met Lys Lys Thr Gly Ala  
 100 105 110

Thr Ala Leu Val Thr Ala His His Ala Asp Asp Gln Val Glu Thr Ile  
 115 120 125

Phe Met Arg Leu Ile Arg Gly Thr Arg Leu Arg Tyr Leu Ser Gly Ile  
 130 135 140

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Lys Glu Lys Gln Val Val Gly Glu Ile Glu Ile Ile Arg Pro Phe Leu  
 145 150 155 160

His Phe Gln Lys Lys Asp Phe Pro Ser Ile Phe His Phe Glu Asp Thr  
 165 170 175

Ser Asn Gln Glu Asn His Tyr Phe Arg Asn Arg Ile Arg Asn Ser Tyr  
 180 185 190

Leu Pro Glu Leu Glu Lys Glu Asn Pro Arg Phe Arg Asp Ala Ile Leu  
 195 200 205

Gly Ile Gly Asn Glu Ile Leu Asp Tyr Asp Leu Ala Ile Ala Glu Leu  
 210 215 220

Ser Asn Asn Ile Asn Val Glu Asp Leu Gln Gln Leu Phe Ser Tyr Ser  
 225 230 235 240

Glu Ser Thr Gln Arg Val Leu Leu Gln Thr Tyr Leu Asn Arg Phe Pro  
 245 250 255

Asp Leu Asn Leu Thr Lys Ala Gln Phe Ala Glu Val Gln Gln Ile Leu  
 260 265 270

Lys Ser Lys Ser Gln Tyr Arg His Pro Ile Lys Asn Gly Tyr Glu Leu  
 275 280 285

Ile Lys Glu Tyr Gln Gln Phe Gln Ile Cys Lys Ile Ser Pro Gln Ala  
 290 295 300

Asp Glu Lys Glu Asp Glu Leu Val Leu His Tyr Gln Asn Gln Val Ala  
 305 310 315 320

Tyr Gln Gly Tyr Leu Phe Ser Phe Gly Leu Pro Leu Glu Gly Glu Leu  
 325 330 335

Ile Gln Gln Ile Pro Val Ser Arg Glu Thr Ser Ile His Ile Arg His  
 340 345 350

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Arg Lys Thr Gly Asp Val Leu Ile Lys Asn Gly His Arg Lys Lys Leu  
 355 360 365

Arg Arg Leu Phe Ile Asp Leu Lys Ile Pro Met Glu Lys Arg Asn Ser  
 370 375 380

Ala Leu Ile Ile Glu Gln Phe Gly Glu Ile Val Ser Ile Leu Gly Ile  
 385 390 395 400

Ala Thr Asn Asn Leu Ser Lys Lys Thr Lys Asn Asp Ile Met Asn Thr  
 405 410 415

Val Leu Tyr Ile Glu Lys Ile Asp Arg  
 420 425

<210> 25

<211> 422

<212> PRT

<213> Streptococcus pneumoniae

<400> 25

Met Arg Lys Phe Leu Ile Ile Leu Leu Leu Pro Ser Phe Leu Thr Ile  
 1 5 10 15

Ser Lys Val Val Ser Thr Glu Lys Glu Val Val Tyr Thr Ser Lys Glu  
 20 25 30

Ile Tyr Tyr Leu Ser Gln Ser Asp Phe Gly Ile Tyr Phe Arg Glu Lys  
 35 40 45

Leu Ser Ser Pro Met Val Tyr Gly Glu Val Pro Val Tyr Ala Asn Glu  
 50 55 60

Asp Leu Val Val Glu Ser Gly Lys Leu Thr Pro Lys Thr Ser Phe Gln  
 65 70 75 80

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65

Ile Thr Glu Trp Arg Leu Asn Lys Gln Gly Ile Pro Val Phe Lys Leu  
85 90 95

Ser Asn His Gln Phe Ile Ala Ala Asp Lys Arg Phe Leu Tyr Asp Gln  
100 105 110

Ser Glu Val Thr Pro Thr Ile Lys Lys Val Trp Leu Glu Ser Asp Phe  
115 120 125

Lys Leu Tyr Asn Ser Pro Tyr Asp Leu Lys Glu Val Lys Ser Ser Leu  
130 135 140

Ser Ala Tyr Ser Gln Val Ser Ile Asp Lys Thr Met Phe Val Glu Gly  
145 150 155 160

Arg Glu Phe Leu His Ile Asp Gln Ala Gly Trp Val Ala Lys Glu Ser  
165 170 175

Thr Ser Glu Glu Asp Asn Arg Met Ser Lys Val Gln Glu Met Leu Ser  
180 185 190

Glu Lys Tyr Gln Lys Asp Ser Phe Ser Ile Tyr Val Lys Gln Leu Thr  
195 200 205

Thr Gly Lys Glu Ala Gly Ile Asn Gln Asp Glu Lys Met Tyr Ala Ala  
210 215 220

Ser Val Leu Lys Leu Ser Tyr Leu Tyr Tyr Thr Gln Glu Lys Ile Asn  
225 230 235 240

Glu Gly Leu Tyr Gln Leu Asp Thr Thr Val Lys Tyr Val Ser Ala Val  
245 250 255

Asn Asp Phe Pro Gly Ser Tyr Lys Pro Glu Gly Ser Gly Ser Leu Pro  
260 265 270

Lys Lys Glu Asp Asn Lys Glu Tyr Ser Leu Lys Asp Leu Ile Thr Lys  
275 280 285

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Met Lys Lys Gln Asn Asn Gly Leu Ile Lys Asn Pro Phe Leu Trp Leu  
1 5 10 15

Leu Phe Ile Phe Phe Leu Val Thr Gly Phe Gln Tyr Phe Tyr Ser Gly  
 20 25 30

Asn Asn Ser Gly Gly Ser Gln Gln Ile Asn Tyr Thr Glu Leu Val Gln  
 35 40 45

Glu Ile Thr Asp Gly Asn Val Lys Glu Leu Thr Tyr Gln Pro Asn Gly  
 50 55 60

Ser Val Ile Glu Val Ser Gly Val Tyr Lys Asn Pro Lys Thr Ser Lys  
 65 70 75 80

Glu Glu Thr Gly Ile Gln Phe Phe Thr Pro Ser Val Thr Lys Val Glu  
 85 90 95

Lys Phe Thr Ser Thr Ile Leu Pro Ala Asp Thr Thr Val Ser Glu Leu  
 100 105 110

Gln Lys Leu Ala Thr Asp His Lys Ala Glu Val Thr Val Lys His Glu  
 115 120 125

Ser Ser Ser Gly Ile Trp Ile Asn Leu Leu Val Ser Ile Val Pro Phe  
 130 135 140

Gly Ile Leu Phe Phe Phe Leu Phe Ser Met Met Gly Asn Met Gly Gly  
 145 150 155 160

Gly Asn Gly Arg Asn Pro Met Ser Phe Gly Arg Ser Lys Ala Lys Ala  
 165 170 175

Ala Asn Lys Glu Asp Ile Lys Val Arg Phe Ser Asp Val Ala Gly Ala  
 180 185 190

Glu Glu Glu Lys Gln Glu Leu Val Glu Val Val Glu Phe Leu Lys Asp  
 195 200 205

Pro Lys Arg Phe Thr Lys Leu Gly Ala Arg Ile Pro Ala Gly Val Leu  
 210 215 220

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[illegible]

Thr Gly Lys Met Pro Glu Ala Val Glu Glu Glu Ser His Ala Leu Ser  
625                    630                    635                    640

645

650

<211> 563

<212> PRT

<213> Streptococcus pneumoniae

<400> 27

Met Lys Arg Ser Ser Leu Leu Val Arg Met Val Ile Ser Ile Phe Leu

1

5

10

15

Val Phe Leu Ile Leu Leu Ala Leu Val Gly Thr Phe Tyr Tyr Gln Ser

20

25

30

Ser Ser Ser Ala Ile Glu Ala Thr Ile Glu Gly Asn Ser Gln Thr Thr

35

40

45

Ile Ser Gln Thr Ser His Phe Ile Gln Ser Tyr Ile Lys Lys Leu Glu

50

55

60

Thr Thr Ser Thr Gly Leu Thr Gln Gln Thr Asp Val Leu Ala Tyr Ala

65

70

75

80

Glu Asn Pro Ser Gln Asp Lys Val Glu Gly Ile Arg Asp Leu Phe Leu

85

90

95

Thr Ile Leu Lys Ser Asp Lys Asp Leu Lys Thr Val Val Leu Val Thr

100

105

110

Lys Ser Gly Gln Val Ile Ser Thr Asp Asp Ser Val Gln Met Lys Thr

115

120

125

Ser Ser Asp Met Met Ala Glu Asp Trp Tyr Gln Lys Ala Ile His Gln

130

135

140

Gly Ala Met Pro Val Leu Thr Pro Ala Arg Lys Ser Asp Ser Gln Trp  
 145 150 155 160

Val Ile Ser Val Thr Gln Glu Leu Val Asp Ala Lys Gly Ala Asn Leu  
 165 170 175

Gly Val Leu Arg Leu Asp Ile Ser Tyr Glu Thr Leu Glu Ala Tyr Leu  
 180 185 190

Asn Gln Leu Gln Leu Gly Gln Gln Gly Phe Ala Phe Ile Ile Asn Glu  
 195 200 205

Asn His Glu Phe Val Tyr His Pro Gln His Thr Val Tyr Ser Ser Ser  
 210 215 220

Ser Lys Met Glu Ala Met Lys Pro Tyr Ile Asp Thr Gly Gln Gly Tyr  
 225 230 235 240

Thr Pro Gly His Lys Ser Tyr Val Ser Gln Glu Lys Ile Ala Gly Thr  
 245 250 255

Asp Trp Thr Val Leu Gly Val Ser Ser Leu Glu Lys Leu Asp Gln Val  
 260 265 270

Arg Ser Gln Leu Leu Trp Thr Leu Leu Gly Ala Ser Val Thr Ser Leu  
 275 280 285

Leu Val Cys Leu Cys Leu Val Trp Phe Ser Leu Lys Arg Trp Ile Ala  
 290 295 300

Pro Leu Lys Asp Leu Arg Glu Thr Met Leu Glu Ile Ala Ser Gly Ala  
 305 310 315 320

Gln Asn Leu Arg Ala Lys Glu Val Gly Ala Tyr Glu Leu Arg Glu Val  
 325 330 335

Thr Arg Gln Phe Asn Ala Met Leu Asp Gln Ile Asp Gln Leu Met Val  
 340 345 350

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Ala Ile Arg Ser Gln Glu Glu Thr Thr Arg Gln Tyr Gln Leu Gln Ala  
355 360 365

Leu Ser Ser Gln Ile Asn Pro His Phe Leu Tyr Asn Thr Leu Asp Thr  
370 375 380

Ile Ile Trp Met Ala Glu Phe His Asp Ser Gln Arg Val Val Gln Val  
385 390 395 400

Thr Lys Ser Leu Ala Thr Tyr Phe Arg Leu Ala Leu Asn Gln Gly Lys  
405 410 415

Asp Leu Ile Cys Leu Ser Asp Glu Ile Asn His Val Arg Gln Tyr Leu  
420 425 430

Phe Ile Gln Lys Gln Arg Tyr Gly Asp Lys Leu Glu Tyr Glu Ile Asn  
435 440 445

Glu Asn Val Ala Phe Asp Asn Leu Val Leu Pro Lys Leu Val Leu Gln  
450 455 460

Pro Leu Val Glu Asn Ala Leu Tyr His Gly Ile Lys Glu Lys Glu Gly  
465 470 475 480

Gln Gly His Ile Lys Leu Ser Val Gln Lys Gln Asp Ser Gly Leu Val  
485 490 495

Ile Arg Ile Glu Asp Asp Gly Val Gly Phe Gln Asp Ala Gly Asp Ser  
500 505 510

Ser Gln Ser Gln Leu Lys Arg Gly Gly Val Gly Leu Gln Asn Val Asp  
515 520 525

Gln Arg Leu Lys Leu His Phe Gly Ala Asn Tyr His Met Lys Ile Asp  
530 535 540

Ser Arg Pro Gln Lys Gly Thr Lys Val Glu Ile Tyr Ile Asn Arg Ile  
545 550 555 560

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Glu Thr Ser

&lt;210&gt; 28

&lt;211&gt; 563

&lt;212&gt; PRT

&lt;213&gt; Streptococcus pneumoniae

&lt;400&gt; 28

Met Lys Arg Ser Ser Leu Leu Val Arg Met Val Ile Ser Ile Phe Leu

1

5

10

15

Val Phe Leu Ile Leu Leu Ala Leu Val Gly Thr Phe Tyr Tyr Gln Ser

20

25

30

Ser Ser Ser Ala Ile Glu Ala Thr Ile Glu Gly Asn Ser Gln Thr Thr

35

40

45

Ile Ser Gln Thr Ser His Phe Ile Gln Ser Tyr Ile Lys Lys Leu Glu

50

55

60

Thr Thr Ser Thr Gly Leu Thr Gln Gln Thr Asp Val Leu Ala Tyr Ala

65

70

75

80

Glu Asn Pro Ser Gln Asp Lys Val Glu Gly Ile Arg Asp Leu Phe Leu

85

90

95

Thr Ile Leu Lys Ser Asp Lys Asp Leu Lys Thr Val Val Leu Val Thr

100

105

110

Lys Ser Gly Gln Val Ile Ser Thr Asp Asp Ser Val Gln Met Lys Thr

115

120

125

Ser Ser Asp Met Met Ala Glu Asp Trp Tyr Gln Lys Ala Ile His Gln

130

135

140

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Gly Ala Met Pro Val Leu Thr Pro Ala Arg Lys Ser Asp Ser Gln Trp  
 145 150 155 160

Val Ile Ser Val Thr Gln Glu Leu Val Asp Ala Lys Gly Ala Asn Leu  
 165 170 175

Gly Val Leu Arg Leu Asp Ile Ser Tyr Glu Thr Leu Glu Ala Tyr Leu  
 180 185 190

Asn Gln Leu Gln Leu Gly Gln Gln Gly Phe Ala Phe Ile Ile Asn Glu  
 195 200 205

Asn His Glu Phe Val Tyr His Pro Gln His Thr Val Tyr Ser Ser Ser  
 210 215 220

Ser Lys Met Glu Ala Met Lys Pro Tyr Ile Asp Thr Gly Gln Gly Tyr  
 225 230 235 240

Thr Pro Gly His Lys Ser Tyr Val Ser Gln Glu Lys Ile Ala Gly Thr  
 245 250 255

Asp Trp Thr Val Leu Gly Val Ser Ser Leu Glu Lys Leu Asp Gln Val  
 260 265 270

Arg Ser Gln Leu Leu Trp Thr Leu Leu Gly Ala Ser Val Thr Ser Leu  
 275 280 285

Leu Val Cys Leu Cys Leu Val Trp Phe Ser Leu Lys Arg Trp Ile Ala  
 290 295 300

Pro Leu Lys Asp Leu Arg Glu Thr Met Leu Glu Ile Ala Ser Gly Ala  
 305 310 315 320

Gln Asn Leu Arg Ala Lys Glu Val Gly Ala Tyr Glu Leu Arg Glu Val  
 325 330 335

Thr Arg Gln Phe Asn Ala Met Leu Asp Gln Ile Asp Gln Leu Met Val  
 340 345 350

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 005570 03265260

Ala Ile Arg Ser Gln Glu Glu Thr Thr Arg Gln Tyr Gln Leu Gln Ala  
355 360 365

Leu Ser Ser Gln Ile Asn Pro His Phe Leu Tyr Asn Thr Leu Asp Thr  
370 375 380

Ile Ile Trp Met Ala Glu Phe His Asp Ser Gln Arg Val Val Gln Val  
385 390 395 400

Thr Lys Ser Leu Ala Thr Tyr Phe Arg Leu Ala Leu Asn Gln Gly Lys  
405 410 415

Asp Leu Ile Cys Leu Ser Asp Glu Ile Asn His Val Arg Gln Tyr Leu  
420 425 430

Phe Ile Gln Lys Gln Arg Tyr Gly Asp Lys Leu Glu Tyr Glu Ile Asn  
435 440 445

Glu Asn Val Ala Phe Asp Asn Leu Val Leu Pro Lys Leu Val Leu Gln  
450 455 460

Pro Leu Val Glu Asn Ala Leu Tyr His Gly Ile Lys Glu Lys Glu Gly  
465 470 475 480

Gln Gly His Ile Lys Leu Ser Val Gln Lys Gln Asp Ser Gly Leu Val  
485 490 495

Ile Arg Ile Glu Asp Asp Gly Val Gly Phe Gln Asp Ala Gly Asp Ser  
500 505 510

Ser Gln Ser Gln Leu Lys Arg Gly Gly Val Gly Leu Gln Asn Val Asp  
515 520 525

Gln Arg Leu Lys Leu His Phe Gly Ala Asn Tyr His Met Lys Ile Asp  
530 535 540

Ser Arg Pro Gln Lys Gly Thr Lys Val Glu Ile Tyr Ile Asn Arg Ile  
545 550 555 560

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<210> 29
<211> 379
<212> PRT
<213> Streptococcus pneumoniae
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Met Phe Phe Lys Leu Leu Arg Glu Ala Leu Lys Val Lys Gln Val Arg  
1 5 10 15

Ser Lys Ile Leu Phe Thr Ile Phe Ile Val Leu Val Phe Arg Ile Gly  
20 25 30

Thr Ser Ile Thr Val Pro Gly Val Asn Ala Asn Ser Leu Asn Ala Leu  
35 40 45

Ser Gly Leu Ser Phe Leu Asn Met Leu Ser Leu Val Ser Gly Asn Ala  
50 55 60

Leu Lys Asn Phe Ser Ile Phe Ala Leu Gly Val Ser Pro Tyr Ile Thr  
65 70 75 80

Ala Ser Ile Val Val Gln Leu Leu Gln Met Asp Ile Leu Pro Lys Phe  
85 90 95

Val Glu Trp Gly Lys Gln Gly Glu Val Gly Arg Arg Lys Leu Asn Gln  
100 105 110

Ala Thr Arg Tyr Ile Ala Leu Val Leu Ala Phe Val Gln Ser Ile Gly  
115 120 125

Ile Thr Ala Gly Phe Asn Thr Leu Ala Gly Ala Gln Leu Ile Lys Thr  
130 135 140

Glu Lys Ala Ala Glu Thr Tyr Lys Arg Val Val Pro Ile Ser Met Glu  
340 345 350

Val Leu Gln Leu Leu Val Pro Ser Ser Leu Val  
370 375

<211> 445

<212> PRT

<213> Streptococcus pneumoniae

<400> 30

Met Asp Ile Arg Gln Val Thr Glu Thr Ile Ala Met Ile Glu Glu Gln  
1 5 10 15

Asn Phe Asp Ile Arg Thr Ile Thr Met Gly Ile Ser Leu Leu Asp Cys  
20 25 30

Ile Asp Pro Asp Ile Asn Arg Ala Ala Glu Lys Ile Tyr Gln Lys Ile  
35 40 45

Thr Thr Lys Ala Ala Asn Leu Val Ala Val Gly Asp Glu Ile Ala Ala  
50 55 60

Glu Leu Gly Ile Pro Ile Val Asn Lys Arg Val Ser Val Thr Pro Ile  
65 70 75 80

Ser Leu Ile Gly Ala Ala Thr Asp Ala Thr Asp Tyr Val Val Leu Ala  
85 90 95

Lys Ala Leu Asp Lys Ala Ala Lys Glu Ile Gly Val Asp Phe Ile Gly  
100 105 110

Gly Phe Ser Ala Leu Val Gln Lys Gly Tyr Gln Lys Gly Asp Glu Ile  
115 120 125

Gly Gly Leu Ser Gly Ala Phe Ile Pro Val Ser Glu Asp Glu Gly Met  
325 330 335

Pro Gly Leu Val Val Ile Leu Val Gly Asp Asn Pro Ala Ser Gln Val  
35 40 45



Gly Asp Val Asp Tyr Glu Ala Val Ala Pro Leu Ala Ser His Ile Thr  
245 250 255

Gln Thr Tyr Gln Ala Ala Leu Arg Thr Leu Asp Arg Lys  
275 280 285

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<400> 32
Met Ser Lys Phe Asn Arg Ile His Leu Val Val Leu Asp Ser Val Gly
      1           5           10          15
```

Asp Gly Ala Ser Asp Thr Leu Gly His Ile Ser Lys Thr Val Gly Leu  
35 40 45

Thr Pro Leu Lys Thr Val Ala Ala Glu Ser Asn Pro Thr Gly Tyr Ala  
65 70 75 80

Trp Glu Ile Met Gly Leu Asn Ile Thr Glu Pro Phe Asp Thr Phe Trp  
100 105 110

Asn Gly Phe Pro Glu Glu Ile Leu Thr Lys Ile Glu Glu Phe Ser Gly  
115 120 125

Leu Pro Glu Ile Ile Ala Ala Met Arg Glu Asn Asp Leu Leu Leu Ile  
325 330 335

Thr Ala Asp His Gly Asn Asp Pro Thr Tyr Ala Gly Thr Asp His Thr  
 340 345 350

Arg Glu Tyr Ile Pro Leu Leu Ala Tyr Ser Pro Ala Phe Lys Gly Asn  
 355 360 365

Gly Leu Ile Pro Val Gly His Phe Ala Asp Ile Ser Ala Thr Val Ala  
 370 375 380

Asp Asn Phe Gly Val Glu Thr Ala Met Ile Gly Glu Ser Phe Leu Asp  
 385 390 395 400

Lys Leu Val

<210> 33

<211> 326

<212> PRT

<213> Streptococcus pneumoniae

<400> 33

Met Phe Ile Ser Ile Ser Ala Gly Ile Val Thr Phe Leu Leu Thr Leu  
 1 5 10 15

Val Glu Ile Pro Ala Phe Ile Gln Phe Tyr Arg Lys Ala Gln Ile Thr  
 20 25 30

Gly Gln Gln Met His Glu Asp Val Lys Gln His Gln Ala Lys Ala Gly  
 35 40 45

Thr Pro Thr Met Gly Gly Leu Val Phe Leu Ile Thr Ser Val Leu Val  
 50 55 60

Ala Phe Phe Phe Ala Leu Phe Ser Ser Gln Phe Ser Asn Asn Val Gly  
 65 70 75 80

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Met Ile Leu Phe Ile Leu Val Leu Tyr Gly Leu Val Gly Phe Leu Asp  
85 90 95

Asp Phe Leu Lys Val Phe Arg Lys Ile Asn Glu Gly Leu Asn Pro Lys  
100 105 110

Gln Lys Leu Ala Leu Gln Leu Leu Gly Gly Val Ile Phe Tyr Leu Phe  
115 120 125

Tyr Glu Arg Gly Gly Asp Ile Leu Ser Val Phe Gly Tyr Pro Val His  
130 135 140

Leu Gly Phe Phe Tyr Ile Phe Phe Ala Leu Phe Trp Leu Val Gly Phe  
145 150 155 160

Ser Asn Ala Val Asn Leu Thr Asp Gly Val Asp Gly Leu Ala Ser Ile  
165 170 175

Ser Val Val Ile Ser Leu Ser Ala Tyr Gly Val Ile Ala Tyr Val Gln  
180 185 190

Gly Gln Met Asp Ile Leu Leu Val Ile Leu Ala Met Ile Gly Gly Leu  
195 200 205

Leu Gly Phe Phe Ile Phe Asn His Lys Pro Ala Lys Val Phe Met Gly  
210 215 220

Asp Val Gly Ser Leu Ala Leu Gly Gly Met Leu Ala Ala Ile Ser Met  
225 230 235 240

Ala Leu His Gln Glu Trp Thr Leu Leu Ile Ile Gly Ile Val Tyr Val  
245 250 255

Phe Glu Thr Thr Ser Val Met Met Gln Val Ser Tyr Phe Lys Leu Thr  
260 265 270

Gly Gly Lys Arg Ile Phe Arg Met Thr Pro Val His His His Phe Glu  
275 280 285

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Phe Leu Leu Gly Phe Leu Ser Ile Phe Ala Gly Lys Glu Met Ile Gly  
100 105 110

Leu Phe Leu Met Leu Pro Leu Ser Phe Ser Ile Tyr Val Leu Gly Val  
305 310 315 320

Ala Thr Ala Leu Gly Tyr Ser Ala Glu Gln Leu Thr Tyr Leu Ile Ser  
35 40 45



Ser Met Val Glu Ser Thr Gly Val Tyr Leu Ala Leu Ser Asp Ile Thr  
245 250 255

His Lys Lys Lys  
420

&lt;210&gt; 36

&lt;211&gt; 784

&lt;212&gt; PRT

&lt;213&gt; Streptococcus pneumoniae

&lt;400&gt; 36

Met Lys Asp Arg Ile Lys Glu Tyr Leu Gln Asp Lys Gly Lys Val Thr

1

5

10

15

Val Asn Asp Leu Ala Gln Ala Leu Gly Lys Asp Ser Ser Lys Asp Phe

20

25

30

Arg Glu Leu Ile Lys Thr Leu Ser Leu Met Glu Arg Lys His Gln Ile

35

40

45

Arg Phe Glu Glu Asp Gly Ser Leu Thr Leu Glu Ile Lys Lys Lys His

50

55

60

Glu Ile Thr Leu Lys Gly Ile Phe His Ala His Lys Asn Gly Phe Gly

65

70

75

80

Phe Val Ser Leu Glu Gly Glu Glu Asp Asp Leu Phe Val Gly Lys Asn

85

90

95

Asp Val Asn Tyr Ala Ile Asp Gly Asp Thr Val Glu Val Val Ile Lys

100

105

110

Lys Val Ala Asp Arg Asn Lys Gly Thr Ala Ala Glu Ala Lys Ile Ile

115

120

125

Asp Ile Leu Glu His Ser Leu Thr Thr Val Val Gly Gln Ile Val Leu

130

135

140

Asp Gln Glu Lys Pro Lys Tyr Ala Gly Tyr Ile Arg Ser Lys Asn Gln

145

150

155

160

Lys Ile Ser Gln Pro Ile Tyr Val Lys Lys Pro Ala Leu Lys Leu Glu

165

170

175

00950707 012504

Gly Thr Glu Val Leu Lys Val Phe Ile Asp Lys Tyr Pro Ser Lys Lys  
 180 185 190

His Asp Phe Phe Val Ala Ser Val Leu Asp Val Val Gly His Ser Thr  
 195 200 205

Asp Val Gly Ile Asp Val Leu Glu Val Leu Glu Ser Met Asp Ile Val  
 210 215 220

Ser Glu Phe Pro Glu Ala Val Val Lys Glu Ala Glu Ser Val Pro Asp  
 225 230 235 240

Ala Pro Ser Gln Lys Asp Met Glu Gly Arg Leu Asp Leu Arg Asp Glu  
 245 250 255

Ile Thr Phe Thr Ile Asp Gly Ala Asp Ala Lys Asp Leu Asp Asp Ala  
 260 265 270

Val His Ile Lys Ala Leu Lys Asn Gly Asn Leu Glu Phe Gly Val His  
 275 280 285

Ile Ala Asp Val Ser Tyr Tyr Val Thr Glu Gly Ser Ala Leu Asp Lys  
 290 295 300

Glu Ala Leu Asn Arg Ala Thr Ser Val Tyr Val Thr Asp Arg Val Val  
 305 310 315 320

Pro Met Leu Pro Glu Arg Leu Ser Asn Gly Ile Cys Ser Leu Asn Pro  
 325 330 335

Gln Val Asp Arg Leu Thr Gln Ser Ala Ile Met Glu Ile Asp Lys His  
 340 345 350

Gly Arg Val Val Asn Tyr Thr Ile Thr Gln Thr Val Ile Lys Thr Ser  
 355 360 365

Phe Arg Met Thr Tyr Ser Asp Val Asn Asp Ile Leu Ala Gly Asp Glu  
 370 375 380

0076979 00504

Gly Arg Ser Lys Glu Ile Ala Glu His Phe Glu Gln Val Ile Pro Glu  
580 585 590

Ile Ala Thr Gln Ser Ser Asn Arg Glu Arg Arg Ala Ile Glu Ala Glu  
595 600 605

Arg Glu Val Glu Ala Met Lys Lys Ala Glu Tyr Met Glu Glu Tyr Val  
610 615 620

Gly Glu Glu Tyr Asp Ala Val Val Ser Ser Ile Val Lys Phe Gly Leu  
625 630 635 640

Phe Val Glu Leu Pro Asn Thr Val Glu Gly Leu Ile His Ile Thr Asn  
645 650 655

Leu Pro Glu Phe Tyr His Phe Asn Glu Arg Asp Leu Thr Leu Arg Gly  
660 665 670

Glu Lys Ser Gly Ile Thr Phe Arg Val Gly Gln Gln Ile Arg Ile Arg  
675 680 685

Val Glu Arg Ala Asp Lys Met Thr Gly Glu Ile Asp Phe Ser Phe Val  
690 695 700

Pro Ser Glu Phe Asp Val Ile Glu Lys Gly Leu Lys Gln Ser Ser Arg  
705 710 715 720

Ser Gly Arg Gly Arg Asp Ser Asn Arg Arg Ser Asp Lys Lys Glu Asp  
725 730 735

Lys Arg Lys Ser Gly Arg Ser Asn Asp Lys Arg Lys His Ser Gln Lys  
740 745 750

Asp Lys Lys Lys Lys Gly Lys Lys Pro Phe Tyr Lys Glu Val Ala Lys  
755 760 765

Lys Gly Ala Lys His Gly Lys Gly Arg Gly Lys Gly Arg Arg Thr Lys  
770 775 780

09769787 043604

&lt;210&gt; 37

&lt;211&gt; 513

&lt;212&gt; PRT

&lt;213&gt; Streptococcus pneumoniae

&lt;400&gt; 37

Met Gly Thr Thr Gly Phe Thr Ile Ile Asp Leu Ile Ile Leu Ile Val

1

5

10

15

Tyr Leu Leu Ala Val Leu Val Ala Gly Ile Tyr Phe Ser Lys Lys Glu

20

25

30

Met Lys Gly Lys Glu Phe Phe Lys Gly Asp Gly Ser Val Pro Trp Tyr

35

40

45

Val Thr Ser Val Ser Ile Phe Ala Thr Met Leu Ser Pro Ile Ser Phe

50

55

60

Leu Gly Leu Ala Gly Ser Ser Tyr Ala Gly Ser Trp Ile Leu Trp Phe

65

70

75

80

Ala Gln Leu Gly Met Val Val Ala Ile Pro Leu Thr Ile Arg Phe Ile

85

90

95

Leu Pro Ile Phe Ala Arg Ile Asp Ile Asp Thr Ala Tyr Asp Tyr Leu

100

105

110

Asp Lys Arg Phe Asn Ser Lys Ala Leu Arg Ile Ile Ser Ala Leu Leu

115

120

125

Phe Ile Ile Tyr Gln Leu Gly Arg Met Ser Ile Ile Met Tyr Leu Pro

130

135

140

Ser Ala Gly Leu Ser Val Leu Thr Gly Ile Asp Ile Asn Ile Leu Ile

145

150

155

160

109710 20269660

Ser Val Ala Thr Ser Trp Thr Leu Asp Ile Gln Asp Val Ile Ser Lys  
355 360 365



Asn Met Ser Asp Asn Arg Arg Thr Lys Ile Ala Gln Phe Val Ser Leu  
370 375 380

Ala Val Gly Leu Phe Ser Ile Gly Val Ser Ile Val Met Ala His Ser  
385 390 395 400

Asp Ile Lys Ser Ala Tyr Glu Trp Phe Asn Ser Phe Met Gly Leu Val  
405 410 415

Leu Gly Leu Leu Gly Gly Val Phe Ile Leu Gly Phe Val Ser Lys Lys  
420 425 430

Ala Asn Lys Gln Gly Ala Tyr Ala Ala Leu Ile Val Ser Thr Ile Val  
435 440 445

Met Val Phe Ile Lys Tyr Phe Leu Pro Pro Thr Ala Val Ser Tyr Trp  
450 455 460

Ala Tyr Ser Leu Ile Ser Ile Ser Val Ser Val Val Ser Gly Tyr Ile  
465 470 475 480

Val Ser Val Leu Thr Gly Asn Lys Val Ser Ala Pro Lys Tyr Thr Thr  
485 490 495

Ile His Asp Ile Thr Glu Ile Lys Ala Asp Ser Ser Trp Glu Val Arg  
500 505 510

His

<210> 38

<211> 484

<212> PRT

<213> Streptococcus pneumoniae

<400> 38

Met Lys Phe Ser Lys Lys Tyr Ile Ala Ala Gly Ser Ala Val Ile Val

1

5

10

15

09567 039260

Ser Leu Ser Leu Cys Ala Tyr Ala Leu Asn Gln His Arg Ser Gln Glu  
20 25 30

Asn Lys Asp Asn Asn Arg Val Ser Tyr Val Asp Gly Ser Gln Ser Ser  
35 40 45

Gln Lys Ser Glu Asn Leu Thr Pro Asp Gln Val Ser Gln Lys Glu Gly  
50 55 60

Ile Gln Ala Glu Gln Ile Val Ile Lys Ile Thr Asp Gln Gly Tyr Val  
65 70 75 80

Thr Ser His Gly Asp His Tyr His Tyr Tyr Asn Gly Lys Val Pro Tyr  
85 90 95

Asp Ala Leu Phe Ser Glu Glu Leu Leu Met Lys Asp Pro Asn Tyr Gln  
100 105 110

Leu Lys Asp Ala Asp Ile Val Asn Glu Val Lys Gly Gly Tyr Ile Ile  
115 120 125

Lys Val Asp Gly Lys Tyr Tyr Val Tyr Leu Lys Asp Ala Ala His Ala  
130 135 140

Asp Asn Val Arg Thr Lys Asp Glu Ile Asn Arg Gln Lys Gln Glu His  
145 150 155 160

Val Lys Asp Asn Glu Lys Val Asn Ser Asn Val Ala Val Ala Arg Ser  
165 170 175

Gln Gly Arg Tyr Thr Thr Asn Asp Gly Tyr Val Phe Asn Pro Ala Asp  
180 185 190

Ile Ile Glu Asp Thr Gly Asn Ala Tyr Ile Val Pro His Gly Gly His  
195 200 205

Tyr His Tyr Ile Pro Lys Ser Asp Leu Ser Ala Ser Glu Leu Ala Ala  
210 215 220

FOI b7C b7D b7E

Ala Lys Ala His Leu Ala Gly Lys Asn Met Gln Pro Ser Gln Leu Ser  
225 230 235 240

Tyr Ser Ser Thr Ala Ser Asp Asn Asn Thr Gln Ser Val Ala Lys Gly  
245 250 255

Ser Thr Ser Lys Pro Ala Asn Lys Ser Glu Asn Leu Gln Ser Leu Leu  
260 265 270

Lys Glu Leu Tyr Asp Ser Pro Ser Ala Gln Arg Tyr Ser Glu Ser Asp  
275 280 285

Gly Leu Val Phe Asp Pro Ala Lys Ile Ile Ser Arg Thr Pro Asn Gly  
290 295 300

Val Ala Ile Pro His Gly Asp His Tyr His Phe Ile Pro Tyr Ser Lys  
305 310 315 320

Leu Ser Ala Leu Glu Glu Lys Ile Ala Arg Met Val Pro Ile Ser Gly  
325 330 335

Thr Gly Ser Thr Val Ser Thr Asn Ala Lys Pro Asn Glu Val Val Ser  
340 345 350

Ser Leu Gly Ser Leu Ser Ser Asn Pro Ser Ser Leu Thr Thr Ser Lys  
355 360 365

Glu Leu Ser Ser Ala Ser Asp Gly Tyr Ile Phe Asn Pro Lys Asp Ile  
370 375 380

Val Glu Glu Thr Ala Thr Ala Tyr Ile Val Arg His Gly Asp His Phe  
385 390 395 400

His Tyr Ile Pro Lys Ser Asn Gln Ile Gly Gln Pro Thr Leu Pro Asn  
405 410 415

Asn Ser Leu Ala Thr Pro Ser Pro Ser Leu Pro Ile Asn Pro Gly Thr  
420 425 430

00979-1569260

100

Ser His Glu Lys His Glu Glu Asp Gly Tyr Gly Phe Asp Ala Asn Arg  
435 440 445

Ile Ile Ala Glu Asp Glu Ser Gly Phe Val Met Ser His Gly Asp His  
450 455 460

Asn His Tyr Phe Phe Lys Lys Asp Leu Thr Glu Glu Gln Ile Lys Val  
465 470 475 480

Arg Lys Asn Ile

<210> 39

<211> 153

<212> PRT

<213> Streptococcus pneumoniae

<400> 39

Met Lys Lys Arg Ala Ile Val Ala Val Ile Val Leu Leu Leu Ile Gly  
1 5 10 15

Leu Asp Gln Leu Val Lys Ser Tyr Ile Val Gln Gln Ile Pro Leu Gly  
20 25 30

Glu Val Arg Ser Trp Ile Pro Asn Phe Val Ser Leu Thr Tyr Leu Gln  
35 40 45

Asn Arg Gly Ala Ala Phe Ser Ile Leu Gln Asp Gln Gln Leu Leu Phe  
50 55 60

Ala Val Ile Thr Leu Val Val Val Ile Gly Ala Ile Trp Tyr Leu His  
65 70 75 80

Lys His Met Glu Asp Ser Phe Trp Met Val Leu Gly Leu Thr Leu Ile  
85 90 95

101

Ile Ala Gly Gly Leu Gly Asn Phe Ile Asp Arg Val Ser Gln Gly Phe  
100 105 110

Val Val Asp Met Phe His Leu Asp Phe Ile Asn Phe Ala Ile Phe Asn  
115 120 125

Val Ala Asp Ser Tyr Leu Thr Val Gly Val Ile Ile Leu Leu Ile Ala  
130 135 140

Met Leu Lys Glu Glu Ile Asn Gly Asn  
145 150

<210> 40

<211> 284

<212> PRT

<213> Streptococcus pneumoniae

<400> 40

Met Asn Thr Asn Leu Ala Ser Phe Ile Val Gly Leu Ile Ile Asp Glu  
1 5 10 15

Asn Asp Arg Phe Tyr Phe Val Gln Lys Asp Gly Gln Thr Tyr Ala Leu  
20 25 30

Ala Lys Glu Glu Gly Gln His Thr Val Gly Asp Thr Val Lys Gly Phe  
35 40 45

Ala Tyr Thr Asp Met Lys Gln Lys Leu Arg Leu Thr Thr Leu Glu Val  
50 55 60

Thr Ala Thr Gln Asp Gln Phe Gly Trp Gly Arg Val Thr Glu Val Arg  
65 70 75 80

Lys Asp Leu Gly Val Phe Val Asp Thr Gly Leu Pro Asp Lys Glu Ile  
85 90 95

105610 2346360

Val Val Ser Leu Asp Ile Leu Pro Glu Leu Lys Glu Leu Trp Pro Lys  
 100 105 110

Lys Gly Asp Gln Leu Tyr Ile Arg Leu Glu Val Asp Lys Lys Asp Arg  
 115 120 125

Ile Trp Gly Leu Leu Ala Tyr Gln Glu Asp Phe Gln Arg Leu Ala Arg  
 130 135 140

Pro Ala Tyr Asn Asn Met Gln Asn Gln Asn Trp Pro Ala Ile Val Tyr  
 145 150 155 160

Arg Leu Lys Leu Ser Gly Thr Phe Val Tyr Leu Pro Glu Asn Asn Met  
 165 170 175

Leu Gly Phe Ile His Pro Ser Glu Arg Tyr Ala Glu Pro Arg Leu Gly  
 180 185 190

Gln Val Leu Asp Ala Arg Val Ile Gly Phe Arg Glu Val Asp Arg Thr  
 195 200 205

Leu Asn Leu Ser Leu Lys Pro Arg Ser Phe Glu Met Leu Glu Asn Asp  
 210 215 220

Ala Gln Met Ile Leu Thr Tyr Leu Glu Ser Asn Gly Gly Phe Met Thr  
 225 230 235 240

Leu Asn Asp Lys Ser Ser Pro Asp Asp Ile Lys Ala Thr Phe Gly Ile  
 245 250 255

Ser Lys Gly Gln Phe Lys Lys Ala Leu Gly Gly Leu Met Lys Ala Gly  
 260 265 270

Lys Ile Lys Gln Asp Gln Phe Gly Thr Glu Leu Ile  
 275 280

102-103-104-105-106-107-108-109-110-111-112-113-114-115-116-117-118-119-120-121-122-123-124-125-126-127-128-129-130-131-132-133-134-135-136-137-138-139-140-141-142-143-144-145-146-147-148-149-150-151-152-153-154-155-156-157-158-159-160-161-162-163-164-165-166-167-168-169-170-171-172-173-174-175-176-177-178-179-180-181-182-183-184-185-186-187-188-189-190-191-192-193-194-195-196-197-198-199-200-201-202-203-204-205-206-207-208-209-210-211-212-213-214-215-216-217-218-219-220-221-222-223-224-225-226-227-228-229-230-231-232-233-234-235-236-237-238-239-240-241-242-243-244-245-246-247-248-249-250-251-252-253-254-255-256-257-258-259-260-261-262-263-264-265-266-267-268-269-270-271-272-273-274-275-276-277-278-279-280-281-282-283-284-285-286-287-288-289-290-291-292-293-294-295-296-297-298-299-300-301-302-303-304-305-306-307-308-309-310-311-312-313-314-315-316-317-318-319-320-321-322-323-324-325-326-327-328-329-330-331-332-333-334-335-336-337-338-339-340-341-342-343-344-345-346-347-348-349-350-351-352-353-354-355-356-357-358-359-360-361-362-363-364-365-366-367-368-369-370-371-372-373-374-375-376-377-378-379-380-381-382-383-384-385-386-387-388-389-390-391-392-393-394-395-396-397-398-399-400-401-402-403-404-405-406-407-408-409-410-411-412-413-414-415-416-417-418-419-420-421-422-423-424-425-426-427-428-429-430-431-432-433-434-435-436-437-438-439-440-441-442-443-444-445-446-447-448-449-450-451-452-453-454-455-456-457-458-459-460-461-462-463-464-465-466-467-468-469-470-471-472-473-474-475-476-477-478-479-480-481-482-483-484-485-486-487-488-489-490-491-492-493-494-495-496-497-498-499-500-501-502-503-504-505-506-507-508-509-510-511-512-513-514-515-516-517-518-519-520-521-522-523-524-525-526-527-528-529-530-531-532-533-534-535-536-537-538-539-540-541-542-543-544-545-546-547-548-549-550-551-552-553-554-555-556-557-558-559-560-561-562-563-564-565-566-567-568-569-570-571-572-573-574-575-576-577-578-579-580-581-582-583-584-585-586-587-588-589-590-591-592-593-594-595-596-597-598-599-600-601-602-603-604-605-606-607-608-609-610-611-612-613-614-615-616-617-618-619-620-621-622-623-624-625-626-627-628-629-630-631-632-633-634-635-636-637-638-639-640-641-642-643-644-645-646-647-648-649-650-651-652-653-654-655-656-657-658-659-660-661-662-663-664-665-666-667-668-669-670-671-672-673-674-675-676-677-678-679-680-681-682-683-684-685-686-687-688-689-690-691-692-693-694-695-696-697-698-699-700-701-702-703-704-705-706-707-708-709-710-711-712-713-714-715-716-717-718-719-720-721-722-723-724-725-726-727-728-729-730-731-732-733-734-735-736-737-738-739-740-741-742-743-744-745-746-747-748-749-750-751-752-753-754-755-756-757-758-759-760-761-762-763-764-765-766-767-768-769-770-771-772-773-774-775-776-777-778-779-780-781-782-783-784-785-786-787-788-789-790-791-792-793-794-795-796-797-798-799-800-801-802-803-804-805-806-807-808-809-810-811-812-813-814-815-816-817-818-819-820-821-822-823-824-825-826-827-828-829-830-831-832-833-834-835-836-837-838-839-840-841-842-843-844-845-846-847-848-849-850-851-852-853-854-855-856-857-858-859-860-861-862-863-864-865-866-867-868-869-870-871-872-873-874-875-876-877-878-879-880-881-882-883-884-885-886-887-888-889-890-891-892-893-894-895-896-897-898-899-900-901-902-903-904-905-906-907-908-909-910-911-912-913-914-915-916-917-918-919-920-921-922-923-924-925-926-927-928-929-930-931-932-933-934-935-936-937-938-939-940-941-942-943-944-945-946-947-948-949-950-951-952-953-954-955-956-957-958-959-960-961-962-963-964-965-966-967-968-969-970-971-972-973-974-975-976-977-978-979-980-981-982-983-984-985-986-987-988-989-990-991-992-993-994-995-996-997-998-999-1000

&lt;210&gt; 41

&lt;211&gt; 394

&lt;212&gt; PRT

&lt;213&gt; Streptococcus pneumoniae

&lt;400&gt; 41

Met Lys Asp Val Ser Leu Phe Leu Leu Lys Lys Val Phe Lys Ser Arg

1

5

10

15

Leu Asn Trp Ile Val Leu Ala Leu Phe Val Ser Val Leu Gly Val Thr

20

25

30

Phe Tyr Leu Asn Ser Gln Thr Ala Asn Ser His Ser Leu Glu Ser Arg

35

40

45

Leu Glu Ser Arg Ile Ala Ala Asn Glu Arg Ala Ile Asn Glu Asn Glu

50

55

60

Glu Lys Leu Ser Gln Met Ser Asp Thr Ser Ser Glu Glu Tyr Gln Phe

65

70

75

80

Ala Lys Asn Asn Leu Asp Val Gln Lys Asn Leu Leu Thr Arg Lys Thr

85

90

95

Glu Ile Leu Thr Leu Leu Lys Glu Gly Arg Trp Lys Glu Ala Tyr Tyr

100

105

110

Leu Gln Trp Gln Asp Glu Glu Lys Asn Tyr Glu Phe Val Ser Asn Asp

115

120

125

Pro Thr Ala Ser Pro Gly Leu Lys Met Gly Val Asp Arg Glu Arg Lys

130

135

140

Ile Tyr Gln Ala Leu Tyr Pro Leu Asn Ile Lys Ala His Thr Leu Glu

145

150

155

160

Phe Pro Thr His Gly Ile Asp Gln Ile Val Trp Ile Leu Glu Val Ile

165

170

175

10969797 045604

104

Ile Pro Ser Leu Phe Val Val Ala Ile Ile Phe Met Leu Thr Gln Leu  
180 185 190

Phe Ala Glu Arg Tyr Gln Asn His Leu Asp Thr Ala His Leu Tyr Pro  
195 200 205

Val Ser Lys Val Thr Phe Ala Ile Ser Ser Leu Gly Val Gly Val Gly  
210 215 220

Tyr Val Thr Val Leu Phe Ile Gly Ile Cys Gly Phe Ser Phe Leu Val  
225 230 235 240

Gly Ser Leu Ile Ser Gly Phe Gly Gln Leu Asp Tyr Pro Tyr Pro Ile  
245 250 255

Tyr Ser Leu Val Asn Gln Glu Val Thr Ile Gly Lys Ile Gln Asp Val  
260 265 270

Leu Phe Pro Gly Leu Leu Leu Ala Phe Leu Ala Phe Ile Val Ile Val  
275 280 285

Glu Val Val Tyr Leu Ile Ala Tyr Phe Phe Lys Gln Lys Met Pro Val  
290 295 300

Leu Phe Leu Ser Leu Ile Gly Ile Val Gly Leu Leu Phe Gly Ile Gln  
305 310 315 320

Thr Ile Gln Pro Leu Gln Arg Ile Ala His Leu Ile Pro Phe Thr Tyr  
325 330 335

Leu Arg Ser Val Glu Ile Leu Ser Gly Arg Leu Pro Lys Gln Ile Asp  
340 345 350

Asn Val Asp Leu Asn Trp Ser Met Gly Met Val Leu Leu Pro Cys Leu  
355 360 365

Ile Ile Phe Leu Leu Leu Gly Ile Leu Phe Ile Glu Arg Trp Gly Ser  
370 375 380

00969787 013604



Ser Gln Lys Lys Glu Phe Phe Asn Arg Phe  
 385 390

<210> 42

<211> 448

<212> PRT

<213> Streptococcus pneumoniae

<400> 42

Met Met Lys Phe Ile Leu Asp Ile Val Ser Thr Pro Ala Ile Leu Val  
 1 5 10 15

Ala Leu Ile Ala Ile Leu Gly Leu Val Leu Gln Lys Lys Lys Leu Pro  
 20 25 30

Asp Ile Ile Lys Gly Gly Ile Lys Thr Phe Val Gly Phe Leu Val Val  
 35 40 45

Ser Gly Gly Ala Gly Ile Val Gln Asn Ser Leu Asn Pro Phe Gly Thr  
 50 55 60

Met Phe Glu His Ala Phe His Leu Ser Gly Val Val Pro Asn Asn Glu  
 65 70 75 80

Ala Ile Val Ala Val Ala Leu Thr Thr Tyr Gly Ser Ala Thr Ala Met  
 85 90 95

Ile Met Phe Ala Gly Met Val Phe Asn Ile Leu Ile Ala Arg Phe Thr  
 100 105 110

Arg Phe Lys Tyr Ile Phe Leu Thr Gly His His Thr Leu Tyr Met Ala  
 115 120 125

Cys Met Ile Ala Val Ile Leu Ser Val Ala Gly Phe Thr Ser Leu Pro  
 130 135 140

00769704504

106

Leu Ile Leu Leu Gly Gly Leu Ala Leu Gly Ile Ile Met Ser Ile Ser  
145 150 155 160

Pro Ala Phe Val Gln Lys Tyr Met Val Gln Leu Thr Gly Asn Asp Lys  
165 170 175

Val Ala Leu Gly His Phe Ser Ser Leu Gly Tyr Trp Leu Ser Gly Phe  
180 185 190

Thr Gly Ser Leu Ile Gly Asp Lys Ser Lys Ser Thr Glu Asp Ile Lys  
195 200 205

Phe Pro Lys Ser Leu Ala Phe Leu Arg Asp Ser Thr Val Ser Ile Thr  
210 215 220

Leu Ser Met Ala Val Ile Tyr Ile Ile Val Ala Ile Phe Ala Gly Ser  
225 230 235 240

Glu Tyr Ile Glu Lys Glu Ile Ser Ser Gly Thr Ser Gly Leu Val Tyr  
245 250 255

Ala Leu Gln Leu Ala Gly Gln Phe Ala Ala Gly Val Phe Val Ile Leu  
260 265 270

Ala Gly Val Arg Leu Ile Leu Gly Glu Ile Val Pro Ala Phe Lys Gly  
275 280 285

Ile Ser Glu Arg Leu Val Pro Asn Ser Lys Pro Ala Leu Asp Cys Pro  
290 295 300

Ile Val Tyr Thr Tyr Ala Pro Asn Ala Val Leu Ile Gly Phe Ile Ser  
305 310 315 320

Ser Phe Val Gly Gly Leu Val Ser Met Val Ile Met Ile Ala Ser Gly  
325 330 335

Thr Val Val Ile Leu Pro Gly Val Val Pro His Phe Phe Cys Gly Ala  
340 345 350

009697002829660

107

Thr Ala Gly Val Ile Gly Asn Ala Ser Gly Gly Val Arg Gly Ala Thr  
355 360 365

Ile Gly Ala Phe Leu Gln Gly Ile Leu Ile Ser Phe Leu Pro Val Phe  
370 375 380

Leu Met Pro Val Leu Gly Gly Leu Gly Phe Gln Gly Ser Thr Phe Ser  
385 390 395 400

Asp Ala Asp Phe Gly Leu Ser Gly Ile Ile Leu Gly Met Leu Asn Gln  
405 410 415

Phe Gly Ser Gln Ala Gly Ile Val Ile Gly Leu Val Leu Ile Leu Ala  
420 425 430

Val Met Phe Gly Val Ser Phe Ile Lys Lys Pro Ser Ala Thr Glu Glu  
435 440 445

<210> 43

<211> 333

<212> PRT

<213> Streptococcus pneumoniae

<400> 43

Met Ile Lys Thr Phe Leu Ser Ala Leu Ser Val Ile Leu Phe Ser Ile  
1 5 10 15

Pro Ile Ile Thr Tyr Ser Phe Phe Pro Ser Ser Asn Leu Asn Ile Trp  
20 25 30

Leu Ser Thr Gln Pro Ile Leu Ala Gln Ile Tyr Ala Phe Pro Leu Ala  
35 40 45

009697 0430  
009697 0430

His Asn Gln Leu Ala Ser Lys Tyr Pro Lys Ala Ile Ile Ala Gly Asp  
245 250 255

Phe Asn Ala Thr Met Arg His Gly Ala Leu Ala Lys Ile Ser Ser His  
260 265 270

Arg Asp Ala Leu Asn Ala Leu Pro Pro Phe Glu Arg Gly Thr Trp Asn  
275 280 285

Ser Gln Ser Pro Lys Leu Phe Asn Ala Thr Ile Asp His Ile Leu Leu  
290 295 300

Pro Lys Asn His Tyr Tyr Val Lys Asp Leu Asp Ile Val Ser Phe Gln  
305 310 315 320

Asn Ser Asp His Arg Cys Ile Phe Thr Glu Ile Thr Phe  
325 330

<210> 44

<211> 425

<212> PRT

<213> Streptococcus pneumoniae

<400> 44

Met Asn Pro Ile Gln Arg Ser Trp Ala Tyr Val Ser Arg Lys Arg Leu  
1 5 10 15

Arg Ser Phe Ile Leu Phe Leu Ile Leu Leu Val Leu Leu Ala Gly Ile  
20 25 30

Ser Ala Cys Leu Thr Leu Met Lys Ser Asn Lys Thr Val Glu Ser Asn  
35 40 45

Leu Tyr Lys Ser Leu Asn Thr Ser Phe Ser Ile Lys Lys Ile Glu Asn  
50 55 60

Gly Gln Thr Phe Lys Leu Ser Asp Leu Ala Ser Val Ser Lys Ile Lys  
65 70 75 80

103210 2869460

[illegible]

Phe Glu Gln Ile Lys Asp Ser Val Ala Thr Phe Gln Thr Phe Leu Thr  
275 280 285

111

Ile Phe Leu Tyr Gly Met Leu Ile Ala Gly Ala Gly Ala Leu Ile Leu  
290 295 300

Val Leu Ser Leu Trp Leu Arg Glu Arg Val Tyr Glu Val Gly Ile Leu  
305 310 315 320

Leu Ala Leu Gly Lys Gly Lys Ser Ser Ile Phe Leu Gln Phe Cys Leu  
325 330 335

Glu Val Val Leu Val Ser Leu Gly Ala Leu Leu Pro Ala Phe Val Ala  
340 345 350

Gly Asn Ala Ile Thr Thr Tyr Leu Leu Gln Thr Leu Leu Ala Ser Gly  
355 360 365

Asp Gln Ala Ser Leu Gln Asp Thr Leu Ala Lys Ala Ser Ser Leu Ser  
370 375 380

Thr Ser Ile Leu Ser Phe Ala Glu Ser Tyr Val Phe Leu Val Leu Leu  
385 390 395 400

Ser Cys Leu Ser Val Ala Leu Cys Phe Leu Phe Leu Phe Arg Lys Ser  
405 410 415

Pro Lys Glu Ile Leu Ser Ser Ile Ser  
420 425

<210> 45

<211> 459

<212> PRT

<213> Streptococcus pneumoniae

<400> 45

Met Leu His Asn Ala Phe Ala Tyr Val Thr Arg Lys Phe Phe Lys Ser  
1 5 10 15

Ile Val Ile Phe Leu Ile Ile Leu Leu Met Ala Ser Leu Ser Leu Val  
20 25 30

[illegible]

Asn Thr Ala Ile Thr Asp Ile His Thr Ala Ala Lys Leu Tyr Gly Tyr  
225                      230                      235                      240



113

Thr Glu Asp Thr Ala Ile Tyr Gly Asp Ala Thr Phe Phe Val Thr Ala  
245 250 255

Asp Lys Asn Leu Asp Asp Val Met Lys Glu Leu Asn Gly Ile Ser Gly  
260 265 270

Ile Asn Trp Lys Ser Tyr Thr Leu Val Lys Ser Ser Ser Asn Tyr Pro  
275 280 285

Ala Leu Glu Gln Ser Ile Ser Gly Met Tyr Lys Met Ala Asn Leu Leu  
290 295 300

Phe Trp Gly Ser Leu Ser Phe Ser Val Leu Leu Leu Ala Leu Leu Leu  
305 310 315 320

Ser Leu Trp Ile Asn Ala Arg Arg Lys Glu Val Gly Ile Leu Leu Ser  
325 330 335

Ile Gly Leu Lys Gln Ala Ser Ile Leu Gly Gln Phe Ile Thr Glu Ser  
340 345 350

Ile Leu Ile Ala Ile Pro Ala Leu Val Ser Ala Tyr Phe Leu Ala Asn  
355 360 365

Tyr Thr Ala Arg Ala Ile Gly Asn Thr Val Leu Ala Asn Val Thr Ser  
370 375 380

Gly Val Ala Lys Gln Ala Ser Lys Ala Ala Gln Ala Ser Asn Leu Gly  
385 390 395 400

Gly Gly Ala Glu Val Asp Gly Phe Ser Lys Thr Leu Ser Ser Leu Asp  
405 410 415

Ile Ser Ile Gln Thr Ser Asp Phe Ile Ile Ile Phe Val Leu Ala Leu  
420 425 430

Val Leu Val Val Leu Val Met Ala Leu Ala Ser Ser Asn Leu Leu Arg  
435 440 445

007597-04504

Lys Gln Pro Lys Glu Leu Leu Leu Asp Gly Glu

450

455

&lt;210&gt; 46

&lt;211&gt; 205

&lt;212&gt; PRT

&lt;213&gt; Streptococcus pneumoniae

&lt;400&gt; 46

Met Ser Gln Asp Lys Gln Met Lys Ala Val Ser Pro Leu Leu Gln Arg

1

5

10

15

Val Ile Asn Ile Ser Ser Ile Val Gly Gly Val Gly Ser Leu Ile Phe

20

25

30

Cys Ile Trp Ala Tyr Gln Ala Gly Ile Leu Gln Ser Lys Glu Thr Leu

35

40

45

Ser Ala Phe Ile Gln Gln Ala Gly Ile Trp Gly Pro Pro Leu Phe Ile

50

55

60

Phe Leu Gln Ile Leu Gln Thr Val Val Pro Ile Ile Pro Gly Ala Leu

65

70

75

80

Thr Ser Val Ala Gly Val Phe Ile Tyr Gly His Ile Ile Gly Thr Ile

85

90

95

Tyr Asn Tyr Ile Gly Ile Val Ile Gly Cys Ala Ile Ile Phe Tyr Leu

100

105

110

Val Arg Leu Tyr Gly Ala Ala Phe Val Gln Ser Val Val Ser Lys Arg

115

120

125

Thr Tyr Asp Lys Tyr Ile Asp Trp Leu Asp Lys Gly Asn Arg Phe Asp

130

135

140

005607 01501  
105510 2826260

Figure 1 consists of 12 subplots arranged in a 3x4 grid. Each subplot shows a histogram of the number of non-zero elements in the vector  $x_k$  for  $k=1, 2, \dots, 12$ . The x-axis for all plots is labeled  $x_k$  and ranges from 0 to 10. The y-axis is labeled 'count' and ranges from 0 to 10. The histograms show a distribution that is roughly bell-shaped and centered around 5. The peak count increases from 10 for  $k=1$  to 10 for  $k=12$ .

Ala Lys Glu Ala Ile Lys Glu Glu Lys Leu Lys Gly Tyr Leu Thr Ile  
85 90 95

116

Asp Gln Glu Asp Ser Val Leu Lys Ala Val Tyr His Gly Glu Thr Ser  
100 105 110

Leu Glu Asn Gly Ile Lys Phe Glu Val Thr Gly Thr Leu Asn Glu Leu  
115 120 125

Gln Asn Gln Leu Asn Arg Ser Thr Ala Ser Leu Ser Gln Glu Gln Glu  
130 135 140

Lys Arg Leu Ala Gln Thr Ile Gln Phe Thr Glu Lys Ile Asp Glu Ala  
145 150 155 160

Lys Glu Asn Lys Lys Phe Ile Gln Thr Ile Ala Ala Gly Ala Leu Gly  
165 170 175

Phe Phe Leu Tyr Met Ile Leu Ile Thr Tyr Ala Gly Val Thr Ala Gln  
180 185 190

Glu Val Ala Ser Glu Lys Gly Thr Lys Ile Met Glu Val Val Phe Ser  
195 200 205

Ser Ile Arg Ala Ser His Tyr Phe Tyr Ala Arg Met Met Ala Leu Phe  
210 215 220

Leu Val Ile Leu Thr His Ile Gly Ile Tyr Val Val Gly Gly Leu Ala  
225 230 235 240

Ala Val Leu Leu Phe Lys Asp Leu Pro Phe Leu Ala Gln Ser Gly Ile  
245 250 255

Leu Asp His Leu Gly Asp Ala Ile Ser Leu Asn Thr Leu Leu Phe Ile  
260 265 270

Leu Ile Ser Leu Phe Met Tyr Val Val Leu Ala Ala Phe Leu Gly Ser  
275 280 285

Met Val Ser Arg Pro Glu Asp Ser Gly Lys Ala Leu Ser Pro Leu Met  
290 295 300

09759707 09501

117

Ile Leu Ile Met Gly Gly Phe Phe Gly Val Thr Ala Leu Gly Ala Ala  
305 310 315 320

Gly Asp Asn Leu Leu Leu Lys Ile Gly Ser Tyr Ile Pro Phe Ile Ser  
325 330 335

Thr Phe Phe Met Pro Phe Arg Thr Ile Asn Asp Tyr Ala Gly Gly Ala  
340 345 350

Glu Ala Trp Ile Ser Leu Ala Ile Thr Val Ile Phe Ala Val Val Ala  
355 360 365

Thr Gly Phe Ile Gly Arg Met Tyr Ala Ser Leu Val Leu Gln Thr Asp  
370 375 380

Asp Leu Gly Ile Trp Lys Thr Phe Lys Arg Ala Leu Ser Tyr Lys  
385 390 395

<210> 48

<211> 438

<212> PRT

<213> Streptococcus pneumoniae

<400> 48

Met Thr Glu Thr Ile Lys Leu Met Lys Ala His Thr Ser Val Arg Arg  
1 5 10 15

Phe Lys Glu Gln Glu Ile Pro Gln Val Asp Leu Asn Glu Ile Leu Thr  
20 25 30

Ala Ala Gln Met Ala Ser Ser Trp Lys Asn Phe Gln Ser Tyr Ser Val  
35 40 45

Ile Val Val Arg Ser Gln Glu Lys Lys Asp Ala Leu Tyr Glu Leu Val  
50 55 60

09769797 045504

118

Pro Gln Glu Ala Ile Arg Gln Ser Ala Val Phe Leu Leu Phe Val Gly  
65 70 75 80

Asp Leu Asn Arg Ala Glu Lys Gly Ala Arg Leu His Thr Asp Thr Phe  
85 90 95

Gln Pro Gln Gly Val Glu Gly Leu Leu Ile Ser Ser Val Asp Ala Ala  
100 105 110

Leu Ala Gly Gln Asn Ala Leu Leu Ala Ala Glu Ser Leu Gly Tyr Gly  
115 120 125

Gly Val Ile Ile Gly Leu Val Arg Tyr Lys Ser Glu Glu Val Ala Glu  
130 135 140

Leu Phe Asn Leu Pro Asp Tyr Thr Tyr Ser Val Phe Gly Met Ala Leu  
145 150 155 160

Gly Val Pro Asn Gln His His Asp Met Lys Pro Arg Leu Pro Leu Glu  
165 170 175

Asn Val Val Phe Glu Glu Glu Tyr Gln Glu Gln Ser Thr Glu Ala Ile  
180 185 190

Gln Ala Tyr Asp Arg Val Gln Ala Asp Tyr Ala Gly Ala Arg Ala Thr  
195 200 205

Thr Ser Trp Ser Gln Arg Leu Ala Glu Gln Phe Gly Gln Ala Glu Pro  
210 215 220

Ser Ser Thr Arg Lys Asn Leu Glu Gln Lys Lys Leu Leu Met Leu Lys  
225 230 235 240

Leu Ile Ala Ile Val Gly Thr Asn Ser Lys Arg Ser Thr Asn Arg Gln  
245 250 255

Leu Leu Gln Tyr Met Gln Lys His Phe Thr Asp Lys Ala Glu Ile Glu  
260 265 270

09759797 04504

Phe Asp Trp Glu Asn Leu  
435

&lt;210&gt; 49

&lt;211&gt; 280

&lt;212&gt; PRT

&lt;213&gt; Streptococcus pneumoniae

&lt;400&gt; 49

Met Asn Thr Tyr Gln Leu Asn Asn Gly Val Glu Ile Pro Val Leu Gly

1

5

10

15

Phe Gly Thr Phe Lys Ala Lys Asp Gly Glu Glu Ala Tyr Arg Ala Val

20

25

30

Leu Glu Ala Leu Lys Ala Gly Tyr Arg His Ile Asp Thr Ala Ala Ile

35

40

45

Tyr Gln Asn Glu Glu Ser Val Gly Gln Ala Ile Lys Asp Ser Gly Val

50

55

60

Pro Arg Glu Glu Met Phe Val Thr Thr Lys Leu Trp Asn Ser Gln Gln

65

70

75

80

Thr Tyr Glu Gln Thr Arg Gln Ala Leu Glu Lys Ser Ile Glu Lys Leu

85

90

95

Gly Leu Asp Tyr Leu Asp Leu Tyr Leu Ile His Trp Pro Asn Pro Lys

100

105

110

Pro Leu Arg Glu Asn Asp Ala Trp Lys Thr Arg Asn Ala Glu Val Trp

115

120

125

Arg Ala Met Glu Asp Leu Tyr Gln Glu Gly Lys Ile Arg Ala Ile Gly

130

135

140

Val Ser Asn Phe Leu Pro His His Leu Asp Ala Leu Leu Glu Thr Ala

145

150

155

160

Thr Ile Val Pro Ala Val Asn Gln Val Arg Leu Ala Pro Gly Val Tyr

165

170

175

09769787010504



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Val Tyr Leu Thr Met Lys Glu Ala Pro Arg Lys Lys Ile Ile Pro Asp  
35 40 45

122

Asp Ile Leu Asp Phe Ile Leu Val Ala Phe Pro Leu Ala Ile Leu Gly  
50 55 60

Ala Arg Leu Tyr Tyr Val Ile Phe Arg Phe Asp Tyr Tyr Ser Gln Asn  
65 70 75 80

Leu Gly Glu Ile Phe Ala Ile Trp Asn Gly Gly Leu Ala Ile Tyr Gly  
85 90 95

Gly Leu Ile Thr Gly Ala Leu Val Leu Tyr Ile Phe Ala Asp Arg Lys  
100 105 110

Leu Ile Asn Thr Trp Asp Phe Leu Asp Ile Ala Ala Pro Ser Val Met  
115 120 125

Ile Ala Gln Ser Leu Gly Arg Trp Gly Asn Phe Phe Asn Gln Glu Ala  
130 135 140

Tyr Gly Ala Thr Val Asp Asn Leu Asp Tyr Leu Pro Gly Phe Ile Arg  
145 150 155 160

Asp Gln Met Tyr Ile Glu Gly Ser Tyr Arg Gln Pro Thr Phe Leu Tyr  
165 170 175

Glu Ser Leu Trp Asn Leu Leu Gly Phe Ala Leu Ile Leu Ile Phe Arg  
180 185 190

Arg Lys Trp Lys Ser Leu Arg Arg Gly His Ile Thr Ala Phe Tyr Leu  
195 200 205

Ile Trp Tyr Gly Phe Gly Arg Met Val Ile Glu Gly Met Arg Thr Asp  
210 215 220

Ser Leu Met Phe Phe Gly Phe Arg Val Ser Gln Trp Leu Ser Val Val  
225 230 235 240

Leu Ile Gly Leu Gly Ile Met Ile Val Ile Tyr Gln Asn Arg Lys Lys  
245 250 255

1099970-286360

123

Ala Pro Tyr Tyr Ile Thr Glu Glu Glu Asn

260

265

<210> 51

<211> 129

<212> PRT

<213> Streptococcus pneumoniae

<400> 51

Met Gly Lys Leu Ser Ser Ile Leu Leu Gly Thr Val Ser Gly Ala Ala

1

5

10

15

Leu Ala Leu Phe Leu Thr Ser Asp Lys Gly Lys Gln Val Cys Ser Gln

20

25

30

Ala Gln Asp Phe Leu Asp Asp Leu Arg Glu Asp Pro Glu Tyr Ala Lys

35

40

45

Glu Gln Val Cys Glu Lys Leu Thr Glu Val Lys Glu Gln Ala Thr Asp

50

55

60

Phe Val Leu Lys Thr Lys Glu Gln Val Glu Ser Gly Glu Ile Thr Val

65

70

75

80

Asp Ser Ile Leu Ala Gln Thr Lys Ser Tyr Ala Phe Gln Ala Thr Glu

85

90

95

Ala Ser Lys Asn Gln Leu Asn Asn Leu Lys Glu Gln Trp Gln Glu Lys

100

105

110

Ala Glu Ala Leu Asp Asp Ser Glu Glu Ile Val Ile Asp Ile Thr Glu

115

120

125

Glu

00960707 013604



125

Glu Thr Phe Phe Leu His Ala Phe Leu Leu Phe Phe Ala Leu Tyr Glu  
180 185 190

Asn Phe Phe Gly Tyr Leu Tyr Leu Lys Ser Arg Arg Lys  
195 200 205

<210> 53

<211> 637

<212> PRT

<213> Streptococcus pneumoniae

<400> 53

Met Thr Tyr His Phe Thr Glu Glu Tyr Asp Ile Ile Val Ile Gly Ala  
1 5 10 15

Gly His Ala Gly Val Glu Ala Ser Leu Ala Ala Ser Arg Met Gly Cys  
20 25 30

Lys Val Leu Leu Ala Thr Ile Asn Ile Glu Met Leu Ala Phe Met Pro  
35 40 45

Cys Asn Pro Ser Ile Gly Gly Ser Ala Lys Gly Ile Val Val Arg Glu  
50 55 60

Val Asp Ala Leu Gly Gly Glu Met Ala Lys Thr Ile Asp Lys Thr Tyr  
65 70 75 80

Ile Gln Met Lys Met Leu Asn Thr Gly Lys Gly Pro Ala Val Arg Ala  
85 90 95

Leu Arg Ala Gln Ala Asp Lys Glu Leu Tyr Ser Lys Glu Met Arg Lys  
100 105 110

Thr Val Glu Asn Gln Glu Asn Leu Thr Leu Arg Gln Thr Met Ile Asp  
115 120 125

00969397-03604

[illegible]

Glu Asp Val Gln Arg Asp Leu Val His Ser Ile Lys Gly Leu Glu Asn  
325 330 335

Ala Glu Met Met Arg Thr Gly Tyr Ala Ile Glu Tyr Asp Met Val Leu  
340 345 350

Pro His Gln Leu Arg Ala Thr Leu Glu Thr Lys Lys Ile Ser Gly Leu  
355 360 365

Phe Thr Ala Gly Gln Thr Asn Gly Thr Ser Gly Tyr Glu Glu Ala Ala  
370 375 380

Gly Gln Gly Ile Ile Ala Gly Ile Asn Ala Ala Leu Lys Ile Gln Gly  
385 390 395 400

Lys Pro Glu Leu Ile Leu Lys Arg Ser Asp Gly Tyr Ile Gly Val Met  
405 410 415

Ile Asp Asp Leu Val Thr Lys Gly Thr Ile Glu Pro Tyr Arg Leu Leu  
420 425 430

Thr Ser Arg Ala Glu Tyr Arg Leu Ile Leu Arg His Asp Asn Ala Asp  
435 440 445

Met Arg Leu Thr Glu Met Gly Arg Glu Ile Gly Leu Val Asp Asp Glu  
450 455 460

Arg Trp Ala Arg Phe Glu Ile Lys Lys Asn Gln Phe Asp Asn Glu Met  
465 470 475 480

Lys Arg Leu Asp Ser Ile Lys Leu Lys Pro Val Lys Glu Thr Asn Ala  
485 490 495

Lys Val Glu Glu Met Gly Phe Lys Pro Leu Thr Asp Ala Val Thr Ala  
500 505 510

Lys Glu Phe Leu Arg Arg Pro Glu Val Ser Tyr Gln Asp Val Val Ala  
515 520 525

Phe Ile Gly Pro Ala Ala Glu Asp Leu Asp Asp Lys Ile Ile Glu Leu  
530 535 540

0036970-28269260

128

Ile Glu Thr Glu Ile Lys Tyr Glu Gly Tyr Ile Ser Lys Ala Met Asp  
545 550 555 560

Gln Val Ala Lys Met Lys Arg Met Glu Glu Lys Arg Ile Pro Ala Asn  
565 570 575

Ile Asp Trp Asp Asp Ile Asp Ser Ile Ala Thr Glu Ala Arg Gln Lys  
580 585 590

Phe Lys Leu Ile Asn Pro Glu Thr Ile Gly Gln Ala Ser Arg Ile Ser  
595 600 605

Gly Val Asn Pro Ala Asp Ile Ser Ile Leu Met Val Tyr Leu Glu Gly  
610 615 620

Lys Asn Arg Ser Ile Ser Lys Thr Leu Gln Lys Ser Lys  
625 630 635

<210> 54

<211> 185

<212> PRT

<213> Streptococcus pneumoniae

<400> 54

Met Thr Lys Gln Val Leu Leu Val Asp Asp Glu Glu His Ile Leu Lys  
1 5 10 15

Leu Leu Asp Tyr His Leu Ser Lys Glu Gly Phe Ser Thr Gln Leu Val  
20 25 30

Thr Asn Gly Arg Lys Ala Leu Ala Leu Ala Glu Thr Glu Pro Phe Asp  
35 40 45

Phe Ile Leu Leu Asp Ile Met Leu Pro Gln Leu Asp Gly Met Glu Val  
50 55 60

009697 01560



His Gln Leu Glu Gly Gly Trp Gln Glu Gly Gly Lys Gly Ile Ser Val  
20 25 30

130

Ala Asp Val Met Thr Ala Gly Arg His Gly Val Ala Arg Glu Ile Thr  
35 40 45

Leu Gly Val Leu Glu Gly Lys Tyr Tyr Pro Asn His Glu Ala Ile Asp  
50 55 60

Phe Tyr His Arg Tyr Lys Glu Asp Ile Ala Leu Phe Ala Glu Met Gly  
65 70 75 80

Phe Lys Cys Phe Arg Thr Ser Ile Ala Trp Thr Arg Ile Phe Pro Lys  
85 90 95

Gly Asp Glu Leu Glu Pro Asn Glu Glu Gly Leu Gln Phe Tyr Asp Asn  
100 105 110

Leu Phe Asp Glu Cys Leu Lys Asn Gly Ile Glu Pro Val Ile Thr Leu  
115 120 125

Ser His Phe Glu Met Pro Tyr His Leu Val Thr Glu Tyr Gly Gly Trp  
130 135 140

Lys Asn Arg Lys Leu Ile Asp Phe Phe Ala Arg Phe Ala Glu Val Val  
145 150 155 160

Phe Lys Arg Tyr Lys Asp Lys Val Lys Tyr Trp Met Thr Phe Asn Glu  
165 170 175

Ile Asn Asn Gln Ala Asn Tyr Gln Glu Asp Phe Ala Pro Phe Thr Asn  
180 185 190

Ser Gly Ile Val Tyr Glu Glu Gly Asp Asn Arg Glu Ala Ile Met Tyr  
195 200 205

Gln Ala Ala His Tyr Glu Leu Val Ala Ser Ala Arg Ala Val Lys Ile  
210 215 220

Gly His Glu Ile Asn Pro Asp Phe Gln Ile Gly Cys Met Ile Ala Met  
225 230 235 240

00769797-01604

Thr Gly Glu Met Arg Lys Arg Tyr Gly Phe Ile Tyr Val Asp Lys Asp  
435 440 445

Trp Tyr Lys Glu Val Ile Ser Ser Asn Gly Glu Ser Val Glu  
465                      470                      475

<211> 448

<212> PRT

<213> Streptococcus pneumoniae

<400> 56

Met Asp Gln Gln Asn Gly Leu Phe Gly Phe Leu Glu Asn His Val Met  
1 5 10 15

Gly Pro Met Gly Lys Leu Ala Gln Phe Lys Val Val Arg Ala Ile Thr  
20 25 30

Ala Ala Gly Met Ala Ala Val Pro Phe Thr Ile Val Gly Ser Met Phe  
35 40 45

Leu Val Phe Ser Ile Leu Pro Gln Ala Phe Ser Phe Trp Pro Ile Val  
50 55 60

Ala Asp Ile Phe Ser Ala Ser Phe Asp Lys Phe Thr Ser Leu Tyr Met  
65 70 75 80

Val Ala Asn Tyr Ala Thr Met Gly Ser Leu Ser Leu Tyr Phe Val Leu  
85 90 95

Ser Leu Ala Tyr Glu Leu Thr Lys Ile Tyr Ala Glu Glu Glu Glu Leu  
100 105 110

Asn Met Asn Pro Leu Asn Gly Ala Leu Leu Ala Leu Met Ala Phe Val  
115 120 125

133

Met Thr Val Pro Gln Ile Ile Phe Asp Gly Gly Met Met Lys Thr Val  
130 135 140

Thr Ser Leu Lys Glu Gly Ala Val Ile Ala Asp Gly Trp Ala Met Gly  
145 150 155 160

Asn Val Val Ala Arg Phe Gly Thr Thr Gly Ile Phe Thr Ala Ile Ile  
165 170 175

Met Ala Ile Val Thr Val Leu Ile Tyr Arg Met Cys Val Lys His Asn  
180 185 190

Trp Val Ile Lys Met Pro Glu Ala Val Pro Glu Gly Val Ser Arg Gly  
195 200 205

Phe Thr Ala Leu Val Pro Gly Phe Val Val Ala Phe Val Val Ile Phe  
210 215 220

Ile Asn Gly Leu Leu Val Ala Met Gly Thr Asp Ile Phe Lys Val Ile  
225 230 235 240

Ala Ile Pro Phe Gly Phe Val Ser Asn Leu Thr Asn Ser Trp Ile Gly  
245 250 255

Leu Met Ile Ile Tyr Leu Leu Thr Gln Leu Leu Trp Ile Val Gly Ile  
260 265 270

His Gly Ala Asn Ile Val Phe Ala Phe Val Ser Pro Ile Ala Leu Ala  
275 280 285

Asn Met Ala Glu Asn Ala Ala Gly Gly His Phe Ala Val Ala Gly Glu  
290 295 300

Phe Ser Asn Met Phe Val Ile Ala Gly Gly Ser Gly Ala Thr Leu Gly  
305 310 315 320

Leu Cys Leu Tyr Ile Ala Phe Ala Ser Lys Ser Glu Gln Leu Lys Ala  
325 330 335

009269797-01501

134

Ile Gly Arg Ala Ser Val Val Pro Ala Leu Phe Asn Ile Asn Glu Pro  
340 345 350

Leu Ile Phe Gly Leu Pro Ile Ile Tyr Asn Pro Ala Leu Ala Ile Pro  
355 360 365

Phe Ile Leu Ala Pro Met Val Thr Ala Thr Ile Tyr Tyr Val Ala Asn  
370 375 380

Ser Leu Asn Phe Ile Lys Pro Ile Ile Ala Gln Val Pro Trp Pro Thr  
385 390 395 400

Pro Val Gly Ile Gly Ala Phe Leu Gly Thr Ala Asp Leu Arg Ala Val  
405 410 415

Leu Val Ala Leu Val Cys Ala Phe Ala Ala Phe Leu Val Tyr Leu Pro  
420 425 430

Phe Ile Arg Val Tyr Asp Gln Lys Leu Val Lys Glu Glu Gln Gly Ile  
435 440 445

<210> 57

<211> 657

<212> PRT

<213> Streptococcus pneumoniae

<400> 57

Met Lys Lys Phe Tyr Val Ser Pro Ile Phe Pro Ile Leu Val Gly Leu  
1 5 10 15

Ile Ala Phe Gly Val Leu Ser Thr Phe Ile Ile Phe Val Asn Asn Asn  
20 25 30

Leu Leu Thr Val Leu Ile Leu Phe Leu Phe Val Gly Gly Tyr Val Phe  
35 40 45

007697071013001

Variable	Mean	SD	Min	Max
Age	34.5	10.2	18	65
Gender	0.52	0.50	0	1
Marital status	0.68	0.48	0	1
Education	12.5	1.5	9	16
Income	15.2	8.5	5	35
Occupation	1.2	0.8	0	2
Health status	1.8	0.5	1	3
Stress level	2.5	0.8	1	4
Life satisfaction	3.2	0.6	2	4
Resilience	2.8	0.7	1	4
Optimism	3.5	0.5	2	4
Self-efficacy	3.8	0.4	2	4
Emotional stability	3.1	0.6	2	4
Prosocial behavior	3.4	0.5	2	4
Empathy	3.6	0.4	2	4
Altruism	3.3	0.5	2	4
Helping behavior	3.7	0.4	2	4
Volunteering	3.9	0.3	2	4
Community involvement	3.5	0.5	2	4
Leadership	3.2	0.6	2	4
Teamwork	3.6	0.4	2	4
Communication	3.8	0.3	2	4
Conflict resolution	3.4	0.5	2	4
Problem-solving	3.7	0.4	2	4
Decision-making	3.9	0.3	2	4
Goal setting	3.5	0.5	2	4
Time management	3.6	0.4	2	4
Organization	3.8	0.3	2	4
Productivity	3.9	0.3	2	4
Efficiency	3.7	0.4	2	4
Quality of work	3.8	0.3	2	4
Job satisfaction	3.9	0.3	2	4
Commitment	3.7	0.4	2	4
Engagement	3.8	0.3	2	4
Motivation	3.9	0.3	2	4
Energy	3.7	0.4	2	4
Focus	3.8	0.3	2	4
Attention	3.9	0.3	2	4
Concentration	3.7	0.4	2	4
Memory	3.8	0.3	2	4
Learning	3.9	0.3	2	4
Adaptability	3.7	0.4	2	4
Flexibility	3.8	0.3	2	4
Openness	3.9	0.3	2	4
Curiosity	3.7	0.4	2	4
Imagination	3.8	0.3	2	4
Creativity	3.9	0.3	2	4
Innovation	3.7	0.4	2	4
Change management	3.8	0.3	2	4
Leadership development	3.9	0.3	2	4
Team building	3.7	0.4	2	4
Conflict management	3.8	0.3	2	4
Problem-solving skills	3.9	0.3	2	4
Decision-making skills	3.7	0.4	2	4
Goal setting skills	3.8	0.3	2	4
Time management skills	3.9	0.3	2	4
Organization skills	3.7	0.4	2	4
Productivity skills	3.8	0.3	2	4
Efficiency skills	3.9	0.3	2	4
Quality of work skills	3.7	0.4	2	4
Job satisfaction skills	3.8	0.3	2	4
Commitment skills	3.9	0.3	2	4
Engagement skills	3.7	0.4	2	4
Motivation skills	3.8	0.3	2	4
Energy skills	3.9	0.3	2	4
Focus skills	3.7	0.4	2	4
Attention skills	3.8	0.3	2	4
Concentration skills	3.9	0.3	2	4
Memory skills	3.7	0.4	2	4
Learning skills	3.8	0.3	2	4
Adaptability skills	3.9	0.3	2	4
Flexibility skills	3.7	0.4	2	4
Openness skills	3.8	0.3	2	4
Curiosity skills	3.9	0.3	2	4
Imagination skills	3.7	0.4	2	4
Creativity skills	3.8	0.3	2	4
Innovation skills	3.9	0.3	2	4
Change management skills	3.7	0.4	2	4
Leadership development skills	3.8	0.3	2	4
Team building skills	3.9	0.3	2	4
Conflict management skills	3.7	0.4	2	4
Problem-solving skills	3.8	0.3	2	4
Decision-making skills	3.9	0.3	2	4
Goal setting skills	3.7	0.4	2	4
Time management skills	3.8	0.3	2	4

Lys Phe Ser Val Ile Asp Ala Phe Arg Glu Glu Ser Lys Gln Arg Gln  
245 250 255

Leu Pro Leu Thr Leu Ser Met Gly Phe Ser Tyr Gly Asp Gly Asn His  
 260 265 270

Asp Glu Ile Gly Lys Val Ala Leu Leu Asn Leu Asn Leu Ala Glu Val  
 275 280 285

Arg Gly Gly Asp Gln Val Val Val Lys Glu Asn Asp Glu Thr Lys Asn  
 290 295 300

Pro Val Tyr Phe Gly Gly Gly Ser Ala Ala Ser Ile Lys Arg Thr Arg  
 305 310 315 320

Thr Arg Thr Arg Ala Met Met Thr Ala Ile Ser Asp Lys Ile Arg Ser  
 325 330 335

Val Asp Gln Val Phe Val Val Gly His Lys Asn Leu Asp Met Asp Ala  
 340 345 350

Leu Gly Ser Ala Val Gly Met Gln Leu Phe Ala Ser Asn Val Ile Glu  
 355 360 365

Asn Ser Tyr Ala Leu Tyr Asp Glu Glu Gln Met Ser Pro Asp Ile Glu  
 370 375 380

Arg Ala Val Ser Phe Ile Glu Lys Glu Gly Val Thr Lys Leu Leu Ser  
 385 390 395 400

Val Lys Asp Ala Met Gly Met Val Thr Asn Arg Ser Leu Leu Ile Leu  
 405 410 415

Val Asp His Ser Lys Thr Ala Leu Thr Leu Ser Lys Glu Phe Tyr Asp  
 420 425 430

Leu Phe Thr Gln Thr Ile Val Ile Asp His His Arg Arg Asp Gln Asp  
 435 440 445

Phe Pro Asp Asn Ala Val Ile Thr Tyr Ile Glu Ser Gly Ala Ser Ser  
 450 455 460

136-137-138-139-140-141-142-143-144-145-146-147-148-149-150-151-152-153-154-155-156-157-158-159-160-161-162-163-164-165-166-167-168-169-170-171-172-173-174-175-176-177-178-179-180-181-182-183-184-185-186-187-188-189-190-191-192-193-194-195-196-197-198-199-200-201-202-203-204-205-206-207-208-209-210-211-212-213-214-215-216-217-218-219-220-221-222-223-224-225-226-227-228-229-230-231-232-233-234-235-236-237-238-239-240-241-242-243-244-245-246-247-248-249-250-251-252-253-254-255-256-257-258-259-260-261-262-263-264-265-266-267-268-269-270-271-272-273-274-275-276-277-278-279-280-281-282-283-284-285-286-287-288-289-290-291-292-293-294-295-296-297-298-299-300-301-302-303-304-305-306-307-308-309-310-311-312-313-314-315-316-317-318-319-320-321-322-323-324-325-326-327-328-329-330-331-332-333-334-335-336-337-338-339-340-341-342-343-344-345-346-347-348-349-350-351-352-353-354-355-356-357-358-359-360-361-362-363-364-365-366-367-368-369-370-371-372-373-374-375-376-377-378-379-380-381-382-383-384-385-386-387-388-389-390-391-392-393-394-395-396-397-398-399-400-401-402-403-404-405-406-407-408-409-410-411-412-413-414-415-416-417-418-419-420-421-422-423-424-425-426-427-428-429-430-431-432-433-434-435-436-437-438-439-440-441-442-443-444-445-446-447-448-449-450-451-452-453-454-455-456-457-458-459-460-461-462-463-464-465-466-467-468-469-470-471-472-473-474-475-476-477-478-479-480-481-482-483-484-485-486-487-488-489-490-491-492-493-494-495-496-497-498-499-500-501-502-503-504-505-506-507-508-509-510-511-512-513-514-515-516-517-518-519-520-521-522-523-524-525-526-527-528-529-530-531-532-533-534-535-536-537-538-539-540-541-542-543-544-545-546-547-548-549-550-551-552-553-554-555-556-557-558-559-560-561-562-563-564-565-566-567-568-569-570-571-572-573-574-575-576-577-578-579-580-581-582-583-584-585-586-587-588-589-590-591-592-593-594-595-596-597-598-599-600-601-602-603-604-605-606-607-608-609-610-611-612-613-614-615-616-617-618-619-620-621-622-623-624-625-626-627-628-629-630-631-632-633-634-635-636-637-638-639-640-641-642-643-644-645-646-647-648-649-650-651-652-653-654-655-656-657-658-659-660-661-662-663-664-665-666-667-668-669-670-671-672-673-674-675-676-677-678-679-680-681-682-683-684-685-686-687-688-689-690-691-692-693-694-695-696-697-698-699-700-701-702-703-704-705-706-707-708-709-710-711-712-713-714-715-716-717-718-719-720-721-722-723-724-725-726-727-728-729-730-731-732-733-734-735-736-737-738-739-740-741-742-743-744-745-746-747-748-749-750-751-752-753-754-755-756-757-758-759-760-761-762-763-764-765-766-767-768-769-770-771-772-773-774-775-776-777-778-779-780-781-782-783-784-785-786-787-788-789-790-791-792-793-794-795-796-797-798-799-800-801-802-803-804-805-806-807-808-809-810-811-812-813-814-815-816-817-818-819-820-821-822-823-824-825-826-827-828-829-830-831-832-833-834-835-836-837-838-839-840-841-842-843-844-845-846-847-848-849-850-851-852-853-854-855-856-857-858-859-860-861-862-863-864-865-866-867-868-869-870-871-872-873-874-875-876-877-878-879-880-881-882-883-884-885-886-887-888-889-890-891-892-893-894-895-896-897-898-899-900-901-902-903-904-905-906-907-908-909-910-911-912-913-914-915-916-917-918-919-920-921-922-923-924-925-926-927-928-929-930-931-932-933-934-935-936-937-938-939-940-941-942-943-944-945-946-947-948-949-950-951-952-953-954-955-956-957-958-959-960-961-962-963-964-965-966-967-968-969-970-971-972-973-974-975-976-977-978-979-980-981-982-983-984-985-986-987-988-989-990-991-992-993-994-995-996-997-998-999-1000





&lt;210&gt; 58

&lt;211&gt; 235

&lt;212&gt; PRT

&lt;213&gt; Streptococcus pneumoniae

&lt;400&gt; 58

Met Lys Glu Lys Asn Met Trp Lys Glu Leu Leu Asn Arg Ala Gly Trp

1

5

10

15

Ile Leu Val Phe Leu Leu Ala Val Leu Leu Tyr Gln Val Pro Leu Val

20

25

30

Val Thr Ser Ile Leu Thr Leu Lys Glu Val Ala Leu Leu Gln Ser Gly

35

40

45

Leu Ile Val Ala Gly Leu Ser Ile Val Val Leu Ala Leu Phe Ile Met

50

55

60

Gly Ala Arg Lys Thr Lys Leu Ala Ser Phe Asn Phe Ser Phe Phe Arg

65

70

75

80

Ala Lys Asp Leu Ala Arg Leu Gly Leu Ser Tyr Leu Val Ile Val Gly

85

90

95

Ser Asn Ile Leu Gly Ser Ile Leu Leu Gln Leu Ser Asn Glu Thr Thr

100

105

110

Thr Ala Asn Gln Ser Gln Ile Asn Asp Met Val Gln Asn Ser Ser Leu

115

120

125

Ile Ser Ser Phe Phe Leu Leu Ala Leu Leu Ala Pro Ile Cys Glu Glu

130

135

140

Ile Leu Cys Arg Gly Ile Val Pro Lys Lys Ile Phe Arg Gly Lys Glu

145

150

155

160

Asn Leu Gly Phe Val Val Gly Thr Ile Val Phe Ala Leu Leu His Gln

165

170

175

P03692.60

139

Pro Ser Asn Leu Pro Ser Leu Leu Ile Tyr Gly Gly Met Ser Thr Val  
180 185 190

Leu Ser Trp Thr Ala Tyr Lys Thr Gln Arg Leu Glu Met Ser Ile Leu  
195 200 205

Leu His Met Ile Val Asn Gly Ile Ala Phe Cys Leu Leu Ala Leu Val  
210 215 220

Val Ile Met Ser Arg Thr Leu Gly Ile Ser Val  
225 230 235

<210> 59

<211> 235

<212> PRT

<213> Streptococcus pneumoniae

<400> 59

Met Lys Glu Lys Asn Met Trp Lys Glu Leu Leu Asn Arg Ala Gly Trp  
1 5 10 15

Ile Leu Val Phe Leu Leu Ala Val Leu Leu Tyr Gln Val Pro Leu Val  
20 25 30

Val Thr Ser Ile Leu Thr Leu Lys Glu Val Ala Leu Leu Gln Ser Gly  
35 40 45

Leu Ile Val Ala Gly Leu Ser Ile Val Val Leu Ala Leu Phe Ile Met  
50 55 60

Gly Ala Arg Lys Thr Lys Leu Ala Ser Phe Asn Phe Ser Phe Phe Arg  
65 70 75 80

Ala Lys Asp Leu Ala Arg Leu Gly Leu Ser Tyr Leu Val Ile Val Gly  
85 90 95

105310 232660

140

Ser Asn Ile Leu Gly Ser Ile Leu Leu Gln Leu Ser Asn Glu Thr Thr  
100 105 110

Thr Ala Asn Gln Ser Gln Ile Asn Asp Met Val Gln Asn Ser Ser Leu  
115 120 125

Ile Ser Ser Phe Phe Leu Leu Ala Leu Leu Ala Pro Ile Cys Glu Glu  
130 135 140

Ile Leu Cys Arg Gly Ile Val Pro Lys Lys Ile Phe Arg Gly Lys Glu  
145 150 155 160

Asn Leu Gly Phe Val Val Gly Thr Ile Val Phe Ala Leu Leu His Gln  
165 170 175

Pro Ser Asn Leu Pro Ser Leu Leu Ile Tyr Gly Gly Met Ser Thr Val  
180 185 190

Leu Ser Trp Thr Ala Tyr Lys Thr Gln Arg Leu Glu Met Ser Ile Leu  
195 200 205

Leu His Met Ile Val Asn Gly Ile Ala Phe Cys Leu Leu Ala Leu Val  
210 215 220

Val Ile Met Ser Arg Thr Leu Gly Ile Ser Val  
225 230 235

<210> 60

<211> 533

<212> PRT

<213> Streptococcus pneumoniae

<400> 60

Met Asp Thr Gln Lys Ile Glu Ala Ala Val Lys Met Ile Ile Glu Ala

1

5

10

15

00997071300

141

Val Gly Glu Asp Ala Asn Arg Glu Gly Leu Gln Glu Thr Pro Ala Arg  
20 25 30

Val Ala Arg Met Tyr Gln Glu Ile Phe Ser Gly Leu Gly Gln Thr Ala  
35 40 45

Glu Glu His Leu Ser Lys Ser Phe Glu Ile Ile Asp Asp Asn Met Val  
50 55 60

Val Glu Lys Asp Ile Phe Phe His Thr Met Cys Glu His His Phe Leu  
65 70 75 80

Pro Phe Tyr Gly Arg Ala His Ile Ala Tyr Ile Pro Asp Gly Arg Val  
85 90 95

Ala Gly Leu Ser Lys Leu Ala Arg Thr Val Glu Val Tyr Ser Lys Lys  
100 105 110

Pro Gln Ile Gln Glu Arg Leu Asn Ile Glu Val Ala Asp Ala Leu Met  
115 120 125

Asp Tyr Leu Gly Ala Lys Gly Ala Phe Val Val Ile Glu Ala Glu His  
130 135 140

Met Cys Met Ser Met Arg Gly Val Arg Lys Pro Gly Thr Ala Thr Leu  
145 150 155 160

Thr Thr Val Ala Arg Gly Leu Phe Glu Thr Asp Lys Asp Leu Arg Asp  
165 170 175

Gln Ala Tyr Arg Leu Met Gly Leu Met Lys Asp Leu Phe Leu Lys Arg  
180 185 190

Lys Gln Ala Phe Arg Lys Glu Cys Leu Gly Tyr Leu Arg Tyr Val Leu  
195 200 205

Asn Asp His Phe Val Leu Phe Leu Leu Val Leu Leu Gly Phe Leu Ala  
210 215 220

009697 01504

142

Tyr Gln Tyr Ser Gln Leu Leu Gln His Phe Pro Glu Asn His Trp Pro  
225 230 235 240

Ile Leu Leu Phe Val Gly Ile Thr Ser Val Leu Leu Leu Leu Trp Gly  
245 250 255

Gly Thr Ala Thr Tyr Met Glu Ala Pro Asp Lys Leu Phe Leu Leu Val  
260 265 270

Gly Glu Glu Glu Ile Lys Leu His Leu Lys Arg Gln Thr Gly Ile Ser  
275 280 285

Leu Val Phe Trp Leu Phe Val Gln Thr Leu Phe Leu Leu Leu Phe Ala  
290 295 300

Pro Leu Phe Leu Ala Met Gly Tyr Gly Leu Pro Val Phe Leu Leu Tyr  
305 310 315 320

Val Leu Leu Leu Gly Val Gly Lys Tyr Phe His Phe Cys Gln Lys Ala  
325 330 335

Ser Lys Phe Phe Thr Glu Thr Gly Leu Asp Trp Asp Tyr Val Ile Ser  
340 345 350

Gln Glu Ser Lys Arg Lys Gln Val Leu Leu Arg Phe Phe Ala Leu Phe  
355 360 365

Thr Gln Val Lys Gly Ile Ser Asn Ser Val Lys Arg Arg Ala Tyr Leu  
370 375 380

Asp Phe Ile Leu Lys Ala Val Gln Lys Val Pro Gly Lys Ile Trp Gln  
385 390 395 400

Asn Leu Tyr Leu Arg Ser Tyr Leu Arg Asn Gly Asp Leu Phe Ala Leu  
405 410 415

Ser Leu Arg Leu Leu Leu Leu Ser Leu Leu Ala Gln Val Phe Ile Glu  
420 425 430

00769707 012504

143

Gln Ala Trp Ile Ala Thr Ala Val Val Val Leu Phe Asn Tyr Leu Leu  
435 440 445

Leu Phe Gln Leu Leu Ala Leu Tyr His Ala Phe Asp Tyr Gln Tyr Leu  
450 455 460

Thr Gln Leu Phe Pro Leu Asp Lys Gly Gln Lys Glu Lys Gly Leu Gln  
465 470 475 480

Glu Val Val Arg Gly Leu Thr Ser Phe Val Leu Leu Val Glu Leu Val  
485 490 495

Val Gly Leu Ile Thr Phe Gln Glu Lys Leu Ala Leu Leu Ala Leu Leu  
500 505 510

Gly Ala Gly Leu Val Leu Leu Val Leu Tyr Leu Pro Tyr Gln Val Lys  
515 520 525

Arg Gln Met Gln Asp  
530

<210> 61

<211> 398

<212> PRT

<213> Streptococcus pneumoniae

<400> 61

Met Arg Lys Ser Ile Val Leu Ala Ala Asp Asn Ala Tyr Leu Ile Pro  
1 5 10 15

Leu Glu Thr Thr Ile Lys Ser Val Leu Tyr His Asn Arg Asp Val Asp  
20 25 30

Phe Tyr Ile Leu Asn Ser Asp Ile Ala Pro Glu Trp Phe Lys Leu Leu  
35 40 45

144

Gly Arg Lys Met Glu Val Val Asn Ser Thr Ile Arg Ser Val His Ile  
50 55 60

Asp Lys Glu Leu Phe Glu Ser Tyr Lys Thr Gly Pro His Ile Asn Tyr  
65 70 75 80

Ala Ser Tyr Phe Arg Phe Phe Ala Thr Glu Val Val Glu Ser Asp Arg  
85 90 95

Val Leu Tyr Leu Asp Ser Asp Ile Ile Val Thr Gly Glu Leu Ala Thr  
100 105 110

Leu Phe Glu Ile Asp Leu Lys Gly Tyr Ser Ile Gly Ala Val Asp Asp  
115 120 125

Val Tyr Ala Tyr Glu Gly Arg Lys Ser Gly Phe Asn Thr Gly Met Leu  
130 135 140

Leu Met Asp Val Ala Lys Trp Lys Glu His Ser Ile Val Asn Ser Leu  
145 150 155 160

Leu Glu Leu Ala Ala Glu Gln Asn Gln Val Val His Leu Gly Asp Gln  
165 170 175

Ser Ile Leu Asn Ile Tyr Phe Glu Asp Asn Trp Leu Ala Leu Asp Lys  
180 185 190

Thr Tyr Asn Tyr Met Val Gly Ile Asp Ile Tyr His Leu Ala Gln Glu  
195 200 205

Cys Glu Arg Leu Asp Asp Asn Pro Pro Thr Ile Val His Tyr Ala Ser  
210 215 220

His Asp Lys Pro Trp Asn Thr Tyr Ser Ile Ser Arg Leu Arg Glu Leu  
225 230 235 240

Trp Trp Val Tyr Arg Asp Leu Asp Trp Ser Glu Ile Ala Phe Gln Arg  
245 250 255

0036970 04504



145

Ser Asp Leu Asn Tyr Phe Glu Arg Ser Asn Gln Ser Lys Lys Gln Val  
260 265 270

Met Leu Val Thr Trp Ser Ala Asp Ile Lys His Leu Glu Tyr Leu Val  
275 280 285

Gln Arg Leu Pro Asp Trp His Phe His Leu Ala Ala Pro Cys Asp Cys  
290 295 300

Ser Glu Glu Leu Thr Ser Leu Ser Gln Tyr Thr Asn Val Thr Val Tyr  
305 310 315 320

Gln Asn Val Leu His Ser Arg Ile Asp Trp Leu Leu Asp Asp Ser Ile  
325 330 335

Val Tyr Leu Asp Ile Asn Thr Gly Gly Glu Val Phe Asn Val Val Thr  
340 345 350

Arg Ala Gln Glu Ser Gly Lys Lys Ile Phe Ala Phe Asp Ile Thr Arg  
355 360 365

Lys Ser Met Asp Asp Gly Leu Tyr Asp Gly Ile Phe Ser Val Glu Arg  
370 375 380

Pro Asp Asp Leu Val Asp Arg Met Lys Asn Ile Glu Ile Glu  
385 390 395

<210> 62

<211> 405

<212> PRT

<213> Streptococcus pneumoniae

<400> 62

Met Thr Lys Ile Tyr Ser Ser Ile Ala Val Lys Lys Gly Leu Phe Thr  
1 5 10 15

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Leu Met Tyr Arg Ala Arg Tyr Leu Val Pro Val Asn Lys Ile Gly Leu  
210 215 220

[illegible]

Tyr Arg Pro Leu Ile  
405

<213> Streptococcus pneumoniae

**1                      5                      10                      15**

**20                      25                      30**

**35                      40                      45**

50                      55                      60

65                      70                      75                      80

**85                      90                      95**

100                      105                      110

115                      120                      125

130                      135                      140

**145                      150                      155                      160**

165                      170                      175

149

Val Ile Ile Asp Glu Ile Asp Asp Ile Leu Leu Asp Ser Ala Gln Thr  
180 185 190

Pro Leu Ile Ile Ala Gly Ser Pro Arg Val Gln Ser Asn Tyr Tyr Ala  
195 200 205

Ile Ile Asp Thr Leu Val Thr Thr Leu Val Glu Gly Glu Asp Tyr Ile  
210 215 220

Phe Lys Glu Glu Lys Glu Glu Val Trp Leu Thr Thr Lys Gly Ala Lys  
225 230 235 240

Ser Ala Glu Asn Phe Leu Gly Ile Asp Asn Leu Tyr Lys Glu Glu His  
245 250 255

Ala Ser Phe Ala Arg His Leu Val Tyr Ala Ile Arg Ala His Lys Leu  
260 265 270

Phe Thr Lys Asp Lys Asp Tyr Ile Ile Arg Gly Asn Glu Met Val Leu  
275 280 285

Val Asp Lys Gly Thr Gly Arg Leu Met Glu Met Thr Lys Leu Gln Gly  
290 295 300

Gly Leu His Gln Ala Ile Glu Ala Lys Glu His Val Lys Leu Ser Pro  
305 310 315 320

Glu Thr Arg Ala Met Ala Ser Ile Thr Tyr Gln Ser Leu Phe Lys Met  
325 330 335

Phe Asn Lys Ile Ser Gly Met Thr Gly Thr Gly Lys Val Ala Glu Lys  
340 345 350

Glu Phe Ile Glu Thr Tyr Asn Met Ser Val Val Arg Ile Pro Thr Asn  
355 360 365

Arg Pro Arg Gln Arg Ile Asp Tyr Pro Asp Asn Leu Tyr Ile Thr Leu  
370 375 380

00769797 01501

Region	Year	Population (millions)	Urban population (millions)	Urban population (%)	Population density (per sq km)	Urban population density (per sq km)	Population growth rate (%)	Urban population growth rate (%)	Population growth rate (%)	Urban population growth rate (%)	Population growth rate (%)	Urban population growth rate (%)
Asia	1950	1,000	100	10	100	100	1.0	1.0	1.0	1.0	1.0	1.0
Asia	1960	1,200	150	12	120	120	1.2	1.2	1.2	1.2	1.2	1.2
Asia	1970	1,400	200	14	140	140	1.4	1.4	1.4	1.4	1.4	1.4
Asia	1980	1,600	250	15	160	160	1.6	1.6	1.6	1.6	1.6	1.6
Asia	1990	1,800	300	16	180	180	1.8	1.8	1.8	1.8	1.8	1.8
Asia	2000	2,000	350	17	200	200	2.0	2.0	2.0	2.0	2.0	2.0
Asia	2010	2,200	400	18	220	220	2.2	2.2	2.2	2.2	2.2	2.2
Asia	2020	2,400	450	19	240	240	2.4	2.4	2.4	2.4	2.4	2.4
Asia	2030	2,600	500	20	260	260	2.6	2.6	2.6	2.6	2.6	2.6
Asia	2040	2,800	550	20	280	280	2.8	2.8	2.8	2.8	2.8	2.8
Asia	2050	3,000	600	20	300	300	3.0	3.0	3.0	3.0	3.0	3.0
Asia	2060	3,200	650	20	320	320	3.2	3.2	3.2	3.2	3.2	3.2
Asia	2070	3,400	700	20	340	340	3.4	3.4	3.4	3.4	3.4	3.4
Asia	2080	3,600	750	20	360	360	3.6	3.6	3.6	3.6	3.6	3.6
Asia	2090	3,800	800	21	380	380	3.8	3.8	3.8	3.8	3.8	3.8
Asia	2100	4,000	850	21	400	400	4.0	4.0	4.0	4.0	4.0	4.0
Asia	2110	4,200	900	21	420	420	4.2	4.2	4.2	4.2	4.2	4.2
Asia	2120	4,400	950	21	440	440	4.4	4.4	4.4	4.4	4.4	4.4
Asia	2130	4,600	1,000	21	460	460	4.6	4.6	4.6	4.6	4.6	4.6
Asia	2140	4,800	1,050	21	480	480	4.8	4.8	4.8	4.8	4.8	4.8
Asia	2150	5,000	1,100	22	500	500	5.0	5.0	5.0	5.0	5.0	5.0
Asia	2160	5,200	1,150	22	520	520	5.2	5.2	5.2	5.2	5.2	5.2
Asia	2170	5,400	1,200	22	540	540	5.4	5.4	5.4	5.4	5.4	5.4
Asia	2180	5,600	1,250	22	560	560	5.6	5.6	5.6	5.6	5.6	5.6
Asia	2190	5,800	1,300	22	580	580	5.8	5.8	5.8	5.8	5.8	5.8
Asia	2200	6,000	1,350	22	600	600	6.0	6.0	6.0	6.0	6.0	6.0
Asia	2210	6,200	1,400	22	620	620	6.2	6.2	6.2	6.2	6.2	6.2
Asia	2220	6,400	1,450	22	640	640	6.4	6.4	6.4	6.4	6.4	6.4
Asia	2230	6,600	1,500	22	660	660	6.6	6.6	6.6	6.6	6.6	6.6
Asia	2240	6,800	1,550	22	680	680	6.8	6.8	6.8	6.8	6.8	6.8
Asia	2250	7,000	1,600	22	700	700	7.0	7.0	7.0	7.0	7.0	7.0
Asia	2260	7,200	1,650	22	720	720	7					

Lys Gly Asn Pro Leu Leu Val Phe Val Gly Ser Val Glu Met Ser Gln  
405 410 415

Leu Tyr Ser Ser Leu Leu Phe Arg Glu Gly Ile Ala His Asn Val Leu  
420 425 430

Asn Ala Asn Asn Ala Ala Arg Glu Ala Gln Ile Ile Ser Glu Ser Gly  
435 440 445

Gln Met Gly Ala Val Thr Val Ala Thr Ser Met Ala Gly Arg Gly Thr  
450 455 460

Asp Ile Lys Leu Gly Lys Gly Val Ala Glu Leu Gly Gly Leu Ile Val  
465 470 475 480

Ile Gly Thr Glu Arg Met Glu Ser Gln Arg Ile Asp Leu Gln Ile Arg  
485 490 495

Gly Arg Ser Gly Arg Gln Gly Asp Pro Gly Met Ser Lys Phe Phe Val  
500 505 510

Ser Leu Glu Asp Asp Val Ile Lys Lys Phe Gly Pro Ser Trp Val His  
515 520 525

Lys Lys Tyr Lys Asp Tyr Gln Val Gln Asp Met Thr Gln Pro Glu Val  
530 535 540

Leu Lys Gly Arg Lys Tyr Arg Lys Leu Val Glu Lys Ala Glh His Ala  
545                      550                      555                      560

Ser Asp Ser Ala Gly Arg Ser Ala Arg Arg Gln Thr Leu Glu Tyr Ala  
565 570 575

Glu Ser Met Asn Ile Gln Arg Asp Ile Val Tyr Lys Glu Arg Asn Arg  
580 585 590

Leu Ile Asp Gly Ser Arg Asp Leu Glu Asp Val Val Val Asp Ile Ile  
 595 600 605

Glu Arg Tyr Thr Glu Glu Val Ala Ala Asp His Tyr Ala Ser Arg Glu  
 610 615 620

Leu Leu Phe His Phe Ile Val Thr Asn Ile Ser Phe His Val Lys Glu  
 625 630 635 640

Val Pro Asp Tyr Ile Asp Val Thr Asp Lys Thr Ala Val Arg Ser Phe  
 645 650 655

Met Lys Gln Val Ile Asp Lys Glu Leu Ser Glu Lys Lys Glu Leu Leu  
 660 665 670

Asn Gln His Asp Leu Tyr Glu Gln Phe Leu Arg Leu Ser Leu Leu Lys  
 675 680 685

Ala Ile Asp Asp Asn Trp Val Glu Gln Val Asp Tyr Leu Gln Gln Leu  
 690 695 700

Ser Met Ala Ile Gly Gly Gln Ser Ala Ser Gln Lys Asn Pro Ile Val  
 705 710 715 720

Glu Tyr Tyr Gln Glu Ala Tyr Ala Gly Phe Glu Ala Met Lys Glu Gln  
 725 730 735

Ile His Ala Asp Met Val Arg Asn Leu Leu Met Gly Leu Val Glu Val  
 740 745 750

Thr Pro Lys Gly Glu Ile Val Thr His Phe Pro  
 755 760

103210 2626262

<211> 319

<213> Streptococcus pneumoniae

Met Ile Gly Thr Phe Ala Ala Ala Leu Val Ala Val Leu Ala Asn Phe

**1                      5                      10                      15**

Ile Val Pro Ile Glu Ile Thr Pro Asn Ser Ala Asn Thr Glu Ile Ala

20                      25                      30

Pro Pro Asp Gly Ile Gly Gln Val Leu Ser Asn Leu Leu Leu Lys Leu

35 40 45

Val Asp Asn Pro Val Asn Ala Leu Leu Thr Ala Asn Tyr Ile Arg Ile

50                      55                      60

Leu Ser Trp Ala Val Ile Phe Gly Ile Ala Met Arg Glu Ala Ser Lys

65                      70                      75                      80

Asn Ser Gln Glu Leu Leu Lys Thr Ile Ala Asp Val Thr Ser Lys Ile

85                      90                      95

Val Glu Trp Ile Ile Asn Leu Ala Pro Phe Gly Ile Leu Gly Leu Val

100                      105                      110

Phe Lys Thr Ile Ser Asp Lys Gly Val Gly Ser Leu Ala Asn Tyr Gly

115                      120                      125

Ile Leu Leu Val Leu Leu Val Thr Thr Met Leu Phe Val Ala Pro Val

130                      135                      140

Val Asn Pro Leu Ile Ala Phe Phe Phe Met Arg Arg Asn Pro Tyr Pro

145                      150                      155                      160

Leu Val Trp Asn Cys Leu Arg Val Ser Gly Val Thr Ala Phe Phe Thr

165 170 175



153

Arg Ser Ser Ala Thr Asn Ile Pro Val Asn Met Lys Leu Cys His Asp  
180 185 190

Leu Gly Leu Asn Pro Asp Thr Tyr Ser Val Ser Ile Pro Leu Gly Ser  
195 200 205

Thr Ile Asn Met Ala Gly Val Ala Ile Thr Ile Asn Leu Leu Thr Leu  
210 215 220

Ala Ala Val Asn Thr Leu Gly Ile Pro Val Asp Phe Ala Thr Ala Phe  
225 230 235 240

Val Leu Ser Val Val Ala Ala Ile Ser Ser Cys Asp Ala Ser Gly Ile  
245 250 255

Ala Gly Gly Ser Leu Leu Leu Ile Pro Val Ala Cys Ser Leu Phe Gly  
260 265 270

Ile Ser Asn Asp Ile Ala Ile Gln Ile Val Gly Val Gly Phe Val Ile  
275 280 285

Gly Val Ile Gln Asp Ser Cys Glu Thr Ala Leu Asn Ser Ser Thr Asp  
290 295 300

Val Leu Phe Thr Ala Val Ala Glu Tyr Ala Ala Thr Arg Lys Lys  
305 310 315

<210> 65

<211> 317

<212> PRT

<213> Streptococcus pneumoniae

<400> 65

Met Ser Ile Ser Gln Arg Thr Thr Lys Leu Ile Leu Ala Thr Cys Leu  
1 5 10 15

[illegible]

Asp Tyr His Ile His Tyr Phe Glu Met Arg Gln Arg Gln Ser Arg Ile  
210 215 220

155

Leu Arg Asn Met Ala Gln Gln Ile Asn Thr Cys His Leu Ala Ala Ser  
225 230 235 240

Glu Ser Leu Ile Leu Ala Gln Leu Phe Ser Lys Ile Ala Gly Gln Leu  
245 250 255

Ser Gln Thr Asn Pro Ala Ser Asp Leu Leu Asp Glu Ile Glu Arg Tyr  
260 265 270

Leu Glu Val Phe Arg Asn Arg Ser Leu Pro Lys Thr Arg Glu Glu Phe  
275 280 285

Glu Thr Arg Ala Thr Leu Leu Gln Leu Leu Arg Glu Ala Lys Thr Phe  
290 295 300

Ile Gln Val Lys Val Asp Phe Tyr Gln Lys Tyr Arg Gln  
305 310 315

<210> 66

<211> 537

<212> PRT

<213> Streptococcus pneumoniae

<400> 66

Met Glu Ile Met Ser Leu Ala Ile Ala Val Phe Ala Val Ile Ile Gly  
1 5 10 15

Leu Val Ile Gly Tyr Val Ser Ile Ser Ala Lys Met Lys Ser Ser Gln  
20 25 30

Glu Ala Ala Glu Leu Met Leu Leu Asn Ala Glu Gln Glu Ala Thr Asn  
35 40 45

Leu Arg Gly Gln Ala Glu Arg Glu Ala Asp Leu Leu Val Asn Glu Ala  
50 55 60

156

Lys Arg Glu Ser Lys Ser Leu Lys Lys Glu Ala Leu Leu Glu Ala Lys  
65 70 75 80

Glu Glu Ala Arg Lys Tyr Arg Glu Glu Val Asp Ala Glu Phe Lys Ser  
85 90 95

Glu Arg Gln Glu Leu Lys Gln Ile Glu Ser Arg Leu Thr Glu Arg Ala  
100 105 110

Thr Ser Leu Asp Arg Lys Asp Asp Asn Leu Thr Ser Lys Glu Gln Thr  
115 120 125

Leu Glu Gln Lys Glu Gln Ser Ile Ser Asp Arg Ala Lys Asn Leu Asp  
130 135 140

Ala Arg Glu Glu Gln Leu Glu Glu Val Glu Arg Gln Lys Glu Ala Glu  
145 150 155 160

Leu Glu Arg Ile Gly Ala Leu Ser Gln Ala Glu Ala Arg Asp Ile Ile  
165 170 175

Leu Ala Gln Thr Glu Glu Asn Leu Thr Arg Glu Ile Ala Ser Arg Ile  
180 185 190

Arg Glu Ala Glu Gln Glu Val Lys Glu Arg Ser Asp Lys Met Ala Lys  
195 200 205

Asp Ile Leu Val Gln Ala Met Gln Arg Ile Ala Gly Glu Tyr Val Ala  
210 215 220

Glu Ser Thr Asn Ser Thr Val His Leu Pro Asp Asp Thr Met Lys Gly  
225 230 235 240

Arg Ile Ile Gly Arg Glu Gly Arg Asn Ile Arg Thr Phe Glu Ser Leu  
245 250 255

Thr Gly Val Asp Val Ile Ile Asp Asp Thr Pro Glu Val Val Thr Leu  
260 265 270

00769797 043604

Leu Glu Glu Ile Ala Asn Gly Phe Glu Gly Val Gln Thr Ser Phe Ala  
465                      470                      475                      480

158

Leu Gln Ala Gly Arg Glu Ile Arg Ile Met Val Asn Pro Gly Lys Ile  
485 490 495

Lys Asp Asp Lys Val Thr Ile Leu Ala His Lys Val Arg Lys Lys Ile  
500 505 510

Glu Asn Asn Leu Asp Tyr Pro Gly Asn Ile Lys Val Thr Val Ile Arg  
515 520 525

Glu Leu Arg Ala Val Asp Tyr Ala Lys  
530 535

<210> 67

<211> 104

<212> PRT

<213> Streptococcus pneumoniae

<400> 67

Met Met Leu Lys Pro Ser Ile Asp Thr Leu Leu Asp Lys Val Pro Ser  
1 5 10 15

Lys Tyr Ser Leu Val Ile Leu Glu Ala Lys Arg Ala His Glu Leu Glu  
20 25 30

Ala Gly Ala Pro Ala Thr Gln Gly Phe Lys Ser Glu Lys Ser Thr Leu  
35 40 45

Arg Ala Leu Glu Glu Ile Glu Ser Gly Asn Val Thr Ile His Pro Asp  
50 55 60

Pro Glu Gly Lys Arg Glu Ala Val Arg Arg Arg Ile Glu Glu Glu Lys  
65 70 75 80

Arg Arg Lys Glu Glu Glu Glu Lys Lys Ile Lys Glu Gln Ile Ala Lys  
85 90 95

09769792 043604

Glu Lys Glu Asp Gly Glu Lys Ile

100

<210> 68

<211> 263

<212> PRT

<213> Streptococcus pneumoniae

<400> 68

Met Ser Ala Tyr Gln Leu Pro Thr Val Trp Gln Asp Glu Ala Ser Asn

1

5

10

15

Gln Gly Ala Phe Thr Gly Leu Asn Arg Pro Thr Ala Gly Ala Arg Phe

20

25

30

Glu Gln Asn Leu Pro Lys Gly Glu Gln Ala Phe Gln Leu Tyr Ser Leu

35

40

45

Gly Thr Pro Asn Gly Val Lys Val Thr Ile Leu Leu Glu Glu Leu Leu

50

55

60

Glu Ala Gly Phe Lys Glu Ala Ala Tyr Asp Leu Tyr Lys Ile Ala Ile

65

70

75

80

Met Asp Gly Asp Gln Phe Gly Ser Asp Phe Val Lys Leu Asn Pro Asn

85

90

95

Ser Lys Ile Pro Ala Leu Leu Asp Gln Ser Gly Thr Glu Asn Val Arg

100

105

110

Val Phe Glu Ser Ala His Ile Leu Leu Tyr Leu Ala Glu Lys Phe Gly

115

120

125

Ala Phe Leu Pro Ser Asn Pro Val Glu Lys Val Glu Val Leu Asn Trp

130

135

140

109900 109900 109900

160

Leu Phe Trp Gln Ala Gly Ala Ala Pro Phe Leu Gly Gly Gly Phe Gly  
145 150 155 160

His Phe Phe Asn Tyr Ala Pro Glu Lys Leu Glu Tyr Pro Ile Asn Arg  
165 170 175

Phe Thr Met Glu Val Lys Arg Gln Leu Asp Leu Leu Asp Lys Glu Leu  
180 185 190

Ala Gln Lys Pro Tyr Ile Ala Gly Asn Asp Tyr Thr Ile Ala Asp Ile  
195 200 205

Ala Ile Trp Ser Trp Tyr Gly Gln Leu Val Gln Gly Asn Leu Tyr Gln  
210 215 220

Gly Ser Ala Lys Phe Leu Asp Ala Ser Ser Tyr Gln Asn Leu Val Lys  
225 230 235 240

Trp Ala Glu Lys Ile Ala Asn Arg Pro Ala Val Lys Arg Gly Leu Glu  
245 250 255

Val Thr Tyr Thr Glu Ile Lys  
260

<210> 69

<211> 312

<212> PRT

<213> Streptococcus pneumoniae

<400> 69

Leu Ala Ser Leu Ile Thr Ser Ile Ile Met Phe Tyr Val Gly Phe Asp  
1 5 10 15

Val Leu Arg Asp Thr Ile Gln Lys Ile Leu Ser Arg Glu Glu Thr Val  
20 25 30

00759797 01504



161

Ile Asp Pro Leu Gly Ala Thr Leu Gly Ile Ile Ser Ala Ala Ile Met  
35 40 45

Phe Val Val Tyr Leu Tyr Asn Thr Arg Leu Ser Lys Lys Ser Asn Ser  
50 55 60

Asn Ala Leu Lys Ala Ala Ala Lys Asp Asn Leu Ser Asp Ala Val Thr  
65 70 75 80

Ser Leu Gly Thr Ala Ile Ala Ile Leu Ala Ser Ser Phe Asn Tyr Pro  
85 90 95

Ile Val Asp Lys Leu Val Ala Ile Ile Ile Thr Phe Phe Ile Leu Lys  
100 105 110

Thr Ala Tyr Asp Ile Phe Ile Glu Ser Ser Phe Ser Leu Ser Asp Gly  
115 120 125

Phe Asp Asp Arg Leu Leu Glu Asp Tyr Gln Lys Ala Ile Met Glu Ile  
130 135 140

Pro Lys Ile Ser Lys Val Lys Ser Gln Arg Gly Arg Thr Tyr Gly Ser  
145 150 155 160

Asn Ile Tyr Leu Asp Ile Thr Leu Glu Met Asn Pro Asp Leu Ser Val  
165 170 175

Phe Glu Ser His Glu Ile Ala Asp Gln Val Glu Ser Met Leu Glu Glu  
180 185 190

Arg Phe Gly Val Phe Asp Thr Asp Val His Ile Glu Pro Ala Pro Ile  
195 200 205

Pro Glu Asp Glu Ile Leu Asp Asn Val Tyr Lys Lys Leu Leu Met Arg  
210 215 220

Glu Gln Leu Ile Asp Gln Gly Asn Gln Leu Glu Glu Leu Leu Thr Asp  
225 230 235 240

00969797 013601

[illegible]

Ile Ala Glu Asn Gly Ser Leu Val Glu Tyr Gln Gly Gln Asp Leu Tyr  
65 70 75 80

163

Glu Ala Thr Met Ser Arg Asp Phe Tyr Leu Ala Thr Phe Glu Lys Leu  
85 90 95

Lys Thr Ser Pro Tyr Val Asp Ile Asn Lys Leu Leu Leu Thr Gly Lys  
100 105 110

Lys Gly Ser Tyr Val Leu Asp Thr Val Asp Glu Thr Tyr Leu Lys Val  
115 120 125

Ser Gln His Tyr Asn Glu Asn Ile Gln Lys Val Ala Ser Leu Glu Asp  
130 135 140

Ile Thr Asp Asp Ile Phe Lys Phe Thr Thr Asn Phe Thr Glu Glu Thr  
145 150 155 160

Leu Glu Asp Gly Glu Ala Trp Val Asn Glu Asn Val Pro Gly Val Lys  
165 170 175

Ala Met Thr Thr Gly Phe Glu Ser Ile Asp Ile Val Leu Asp Tyr Val  
180 185 190

Asp Lys Gly Val Ala Ile Val Glu Leu Val Lys Lys Leu Gly Ile Thr  
195 200 205

Met Asp Gln Val Met Ala Phe Gly Asp Asn Leu Asn Asp Leu His Met  
210 215 220

Met Gln Val Val Gly His Pro Val Ala Pro Glu Asn Ala Arg Pro Glu  
225 230 235 240

Ile Leu Glu Leu Ala Lys Thr Val Ile Gly His His Lys Glu Arg Ser  
245 250 255

Val Ile Ala Tyr Met Glu Gly Leu  
260

00769707 04504

&lt;210&gt; 71

&lt;211&gt; 272

&lt;212&gt; PRT

&lt;213&gt; Streptococcus pneumoniae

&lt;400&gt; 71

Met Ala Asp Ile Lys Leu Ile Ala Leu Asp Leu Asp Gly Thr Leu Leu

1

5

10

15

Thr Thr Asp Lys Arg Leu Thr Asp Arg Thr Lys Glu Thr Leu Gln Ala

20

25

30

Ala Arg Asp Arg Gly Ile Lys Val Val Leu Thr Thr Gly Arg Pro Leu

35

40

45

Lys Ala Met Asp Phe Phe Leu His Glu Leu Gly Thr Asp Gly Gln Glu

50

55

60

Asp Glu Tyr Thr Ile Thr Phe Asn Gly Gly Leu Val Gln Lys Asn Thr

65

70

75

80

Gly Glu Ile Leu Asp Lys Thr Val Phe Ser Tyr Asp Asp Val Ala Arg

85

90

95

Leu Tyr Glu Glu Thr Glu Lys Leu Ser Leu Pro Leu Asp Ala Ile Ser

100

105

110

Glu Gly Thr Val Tyr Gln Ile Gln Ser Asp Gln Glu Ser Leu Tyr Ala

115

120

125

Lys Phe Asn Pro Ala Leu Thr Phe Val Pro Val Asp Phe Glu Asp Leu

130

135

140

Ser Ser Gln Met Thr Tyr Asn Lys Cys Val Thr Ala Phe Ala Gln Glu

145

150

155

160

Pro Leu Asp Ala Ala Ile Gln Lys Ile Ser Pro Glu Leu Phe Asp Gln

165

170

175

00369707 045604

165

Tyr Glu Ile Phe Lys Ser Arg Glu Met Leu Leu Glu Trp Ser Pro Lys  
180 185 190

Asn Val His Lys Ala Thr Gly Leu Ala Lys Leu Ile Ser His Leu Gly  
195 200 205

Ile Asp Gln Ser Gln Val Met Ala Cys Gly Asp Glu Ala Asn Asp Leu  
210 215 220

Ser Met Ile Glu Trp Ala Gly Leu Gly Val Ala Met Gln Asn Ala Val  
225 230 235 240

Pro Glu Val Lys Ala Ala Ala Asn Val Val Thr Pro Met Thr Asn Asp  
245 250 255

Glu Glu Ala Val Ala Trp Ala Ile Glu Glu Tyr Val Leu Lys Glu Asn  
260 265 270

<210> 72

<211> 418

<212> PRT

<213> Streptococcus pneumoniae

<400> 72

Met Glu Ser Leu Leu Ile Leu Leu Leu Ile Ala Asn Leu Ala Gly Leu  
1 5 10 15

Phe Leu Ile Trp Gln Arg Gln Asp Arg Gln Glu Lys His Leu Ser Lys  
20 25 30

Ser Leu Glu Asp Gln Ala Asp His Leu Ser Asp Gln Leu Asp Tyr Arg  
35 40 45

00920 0209260

166

Phe Asp Gln Ala Arg Gln Ala Ser Gln Leu Asp Gln Lys Asp Leu Glu  
50 55 60

Val Val Val Ser Asp Arg Leu Gln Glu Val Arg Ile Glu Leu His Gln  
65 70 75 80

Gly Leu Thr Gln Val Arg Gln Glu Met Thr Asp Asn Leu Leu Gln Thr  
85 90 95

Arg Asp Lys Thr Asp Gln Arg Leu Gln Ala Leu Gln Glu Ser Asn Glu  
100 105 110

Gln Arg Leu Glu Gln Met Arg Gln Thr Val Glu Glu Lys Leu Glu Lys  
115 120 125

Thr Leu Gln Thr Arg Leu Gln Ala Ser Phe Glu Thr Val Ser Lys Gln  
130 135 140

Leu Glu Ser Val Asn Arg Gly Leu Gly Glu Met Gln Thr Val Ala Arg  
145 150 155 160

Asp Val Gly Ala Leu Asn Lys Val Leu Ser Gly Thr Lys Thr Arg Gly  
165 170 175

Ile Leu Gly Glu Leu Gln Leu Gly Gln Ile Ile Glu Asp Ile Met Thr  
180 185 190


Pro Ala Gln Tyr Glu Arg Glu Tyr Ala Thr Val Glu Asn Ser Ser Glu  
195 200 205

Arg Val Glu Tyr Ala Ile Lys Leu Pro Gly Gln Gly Asp Gln Glu Tyr  
210 215 220

Val Tyr Leu Pro Ile Asp Ser Lys Phe Pro Leu Ala Asp Tyr Tyr Arg  
225 230 235 240

Leu Glu Glu Ala Tyr Glu Thr Gly Asp Lys Asp Glu Ile Glu Arg Cys  
245 250 255

003637 01304

Structure	Yield (%)	mp (°C)	lit. mp (°C)	IR (cm <sup>-1</sup> )	<sup>1</sup> H NMR (ppm)	MS (m/z)	HRMS (m/z)
	100	150-151	150-151	1650	1.25 (s, 2H), 1.50 (s, 2H), 1.75 (s, 2H), 2.00 (s, 2H), 2.25 (s, 2H), 2.50 (s, 2H), 2.75 (s, 2H), 2.90 (s, 2H), 3.10 (s, 2H), 3.30 (s, 2H), 3.50 (s, 2H), 3.70 (s, 2H), 3.90 (s, 2H), 4.10 (s, 2H), 4.30 (s, 2H), 4.50 (s, 2H), 4.70 (s, 2H), 4.90 (s, 2H), 5.10 (s, 2H), 5.30 (s, 2H), 5.50 (s, 2H), 5.70 (s, 2H), 5.90 (s, 2H), 6.10 (s, 2H), 6.30 (s, 2H), 6.50 (s, 2H), 6.70 (s, 2H), 6.90 (s, 2H), 7.10 (s, 2H), 7.30 (s, 2H), 7.50 (s, 2H), 7.70 (s, 2H), 7.90 (s, 2H), 8.10 (s, 2H), 8.30 (s, 2H), 8.50 (s, 2H), 8.70 (s, 2H), 8.90 (s, 2H), 9.10 (s, 2H), 9.30 (s, 2H), 9.50 (s, 2H), 9.70 (s, 2H), 9.90 (s, 2H), 10.10 (s, 2H), 10.30 (s, 2H), 10.50 (s, 2H), 10.70 (s, 2H), 10.90 (s, 2H), 11.10 (s, 2H), 11.30 (s, 2H), 11.50 (s, 2H), 11.70 (s, 2H), 11.90 (s, 2H), 12.10 (s, 2H), 12.30 (s, 2H), 12.50 (s, 2H), 12.70 (s, 2H), 12.90 (s, 2H), 13.10 (s, 2H), 13.30 (s, 2H), 13.50 (s, 2H), 13.70 (s, 2H), 13.90 (s, 2H), 14.10 (s, 2H), 14.30 (s, 2H), 14.50 (s, 2H), 14.70 (s, 2H), 14.90 (s, 2H), 15.10 (s, 2H), 15.30 (s, 2H), 15.50 (s, 2H), 15.70 (s, 2H), 15.90 (s, 2H), 16.10 (s, 2H), 16.30 (s, 2H), 16.50 (s, 2H), 16.70 (s, 2H), 16.90 (s, 2H), 17.10 (s, 2H), 17.30 (s, 2H), 17.50 (s, 2H), 17.70 (s, 2H), 17.90 (s, 2H), 18.10 (s, 2H), 18.30 (s, 2H), 18.50 (s, 2H), 18.70 (s, 2H), 18.90 (s, 2H), 19.10 (s, 2H), 19.30 (s, 2H), 19.50 (s, 2H), 19.70 (s, 2H), 19.90 (s, 2H), 20.10 (s, 2H), 20.30 (s, 2H), 20.50 (s, 2H), 20.70 (s, 2H), 20.90 (s, 2H), 21.10 (s, 2H), 21.30 (s, 2H), 21.50 (s, 2H), 21.70 (s, 2H), 21.90 (s, 2H), 22.10 (s, 2H), 22.30 (s, 2H), 22.50 (s, 2H), 22.70 (s, 2H), 22.90 (s, 2H), 23.10 (s, 2H), 23.30 (s, 2H), 23.50 (s, 2H), 23.70 (s, 2H), 23.90 (s, 2H), 24.10 (s, 2H), 24.30 (s, 2H), 24.50 (s, 2H), 24.70 (s, 2H), 24.90 (s, 2H), 25.10 (s, 2H), 25.30 (s, 2H), 25.50 (s, 2H), 25.70 (s, 2H), 25.90 (s, 2H), 26.10 (s, 2H), 26.30 (s, 2H), 26.50 (s, 2H), 26.70 (s, 2H), 26.90 (s, 2H), 27.10 (s, 2H), 27.30 (s, 2H), 27.50 (s, 2H), 27.70 (s, 2H), 27.90 (s, 2H), 28.10 (s, 2H), 28.30 (s, 2H), 28.50 (s, 2H), 28.70 (s, 2H), 28.90 (s, 2H), 29.10 (s, 2H), 29.30 (s, 2H), 29.50 (s, 2H), 29.70 (s, 2H), 29.90 (s, 2H), 30.10 (s, 2H), 30.30 (s, 2H), 30.50 (s, 2H), 30.70 (s, 2H), 30.90 (s, 2H), 31.10 (s, 2H), 31.30 (s, 2H), 31.50 (s, 2H), 31.70 (s, 2H), 31.90 (s, 2H), 32.10 (s, 2H), 32.30 (s, 2H), 32.50 (s, 2H), 32.70 (s, 2H), 32.90 (s, 2H), 33.10 (s, 2H), 33.30 (s, 2H), 33.50 (s, 2H), 33.70 (s, 2H), 33.90 (s, 2H), 34.10 (s, 2H), 34.30 (s, 2H), 34.50 (s, 2H), 34.70 (s, 2H), 34.90 (s, 2H), 35.10 (s, 2H), 35.30 (s, 2H), 35.50 (s, 2H), 35.70 (s, 2H), 35.90 (s, 2H), 36.10 (s, 2H), 36.30 (s, 2H), 36.50 (s, 2H), 36.70 (s, 2H), 36.90 (s, 2H), 37.10 (s, 2H), 37.30 (s, 2H), 37.50 (s, 2H), 37.70 (s, 2H), 37.90 (s, 2H), 38.10 (s, 2H), 38.30 (s, 2H), 38.50 (s, 2H), 38.70 (s, 2H), 38.90 (s, 2H), 39.10 (s, 2H), 39.30 (s, 2H), 39.50 (s, 2H), 39.70 (s, 2H), 39.90 (s, 2H), 40.10 (s, 2H), 40.30 (s, 2H), 40.50 (s, 2H), 40.70 (s, 2H), 40.90 (s, 2H), 41.10 (s, 2H), 41.30 (s, 2H), 41.50 (s, 2H), 41.70 (s, 2H), 41.90 (s, 2H), 42.10 (s, 2H), 42.30 (s, 2H), 42.50 (s, 2H), 42.70 (s, 2H), 42.90 (s, 2H), 43.10 (s, 2H), 43.30 (s, 2H), 43.50 (s, 2H), 43.70 (s, 2H), 43.90 (s, 2H), 44.10 (s, 2H), 44.30 (s, 2H), 44.50 (s, 2H), 44.70 (s, 2H), 44.90 (s, 2H), 45.10 (s, 2H), 45.30 (s, 2H), 45.50 (s, 2H), 45.70 (s, 2H), 45.90 (s, 2H), 46.10 (s, 2H), 46.30 (s, 2H), 46.50 (s, 2H), 46.70 (s, 2H), 46.90 (s, 2H), 47.10 (s, 2H), 47.30 (s, 2H), 47.50 (s, 2H), 47.70 (s, 2H), 47.90 (s, 2H), 48.10 (s, 2H), 48.30 (s, 2H), 48.50 (s, 2H), 48.70 (s, 2H), 48.90 (s, 2H), 49.10 (s, 2H), 49.30 (s, 2H), 49.50 (s, 2H), 49.70 (s, 2H), 49.90 (s, 2H), 50.10 (s, 2H), 50.30 (s, 2H), 50.50 (s, 2H), 50.70 (s, 2H), 50.90 (s, 2H), 51.10 (s, 2H), 51.30 (s, 2H), 51.50 (s, 2H), 51.70 (s, 2H), 51.90 (s, 2H), 52.10 (s, 2H), 52.30 (s, 2H), 52.50 (s, 2H), 52.70 (s, 2H), 52.90 (s, 2H), 53.10 (s, 2H), 53.30 (s, 2H), 53.50 (s, 2H), 53.70 (s, 2H), 53.90 (s, 2H), 54.10 (s, 2H), 54.30 (s, 2H), 54.50 (s, 2H), 54.70 (s, 2H), 54.90 (s, 2H), 55.10 (s, 2H), 55.30 (s, 2H), 55.50 (s, 2H), 55.70 (s, 2H), 55.90 (s, 2H), 56.10 (s, 2H), 56.30 (s, 2H), 56.50 (s, 2H), 56.70 (s, 2H), 56.90 (s, 2H), 57.10 (s, 2H), 57.30 (s, 2H), 57.50 (s, 2H), 57.70 (s, 2H), 57.90 (s, 2H), 58.10 (s, 2H), 58.30 (s, 2H), 58.50 (s, 2H), 58.70 (s, 2H), 58.90 (s, 2H), 59.10 (s, 2H), 59.30 (s, 2H), 59.50 (s, 2H), 59.70 (s, 2H), 59.90 (s, 2H), 60.10 (s, 2H), 60.30 (s, 2H), 60.50 (s, 2H), 60.70 (s, 2H), 60.90 (s, 2H), 61.10 (s, 2H), 61.30 (s, 2H), 61.50 (s, 2H), 61.7		

Glu Asp

<211> 313

<213> Streptococcus pneumoniae

Met Lys Ile Ser His Met Lys Lys Asp Glu Leu Phe Glu Gly Phe Tyr

**1                      5                      10                      15**

Leu Ile Lys Ser Ala Asp Leu Arg Gln Thr Arg Ala Gly Lys Asn Tyr

20                      25                      30

Leu Ala Phe Thr Phe Gln Asp Asp Ser Gly Glu Ile Asp Gly Lys Leu

**35                      40                      45**

Trp Asp Ala Gln Pro His Asn Ile Glu Ala Phe Thr Ala Gly Lys Val

50                      55                      60

Val His Met Lys Gly Arg Arg Glu Val Tyr Asn Asn Thr Pro Gln Val

65                      70                      75                      80

Asn Gln Ile Thr Leu Arg Leu Pro Gln Ala Gly Glu Pro Asn Asp Pro

**85                      90                      95**

Ala Asp Phe Lys Val Lys Ser Pro Val Asp Val Lys Glu Ile Arg Asp

100                      105                      110

Tyr Met Ser Gln Met Ile Phe Lys Ile Glu Asn Pro Val Trp Gln Arg

**115**

Ile Val Arg Asn Leu Tyr Thr Lys Tyr Asp Lys Glu Phe Tyr Ser Tyr

130                      135                      140

Pro Ala Ala Lys Thr Asn His His Ala Phe Glu Thr Gly Leu Ala Tyr

145                      150                      155                      160

His Thr Ala Thr Met Val Arg Leu Ala Asp Ala Ile Ser Glu Val Tyr

165                      170                      175



169

Pro Gln Leu Asn Lys Ser Leu Leu Tyr Ala Gly Ile Met Leu His Asp  
180 185 190

Leu Ala Lys Val Ile Glu Leu Thr Gly Pro Asp Gln Thr Glu Tyr Thr  
195 200 205

Val Arg Gly Asn Leu Leu Gly His Ile Ala Leu Ile Asp Ser Glu Ile  
210 215 220

Thr Lys Thr Val Met Glu Leu Gly Ile Asp Asp Thr Lys Glu Glu Val  
225 230 235 240

Val Leu Leu Arg His Val Ile Leu Ser His His Gly Leu Leu Glu Tyr  
245 250 255

Gly Ser Pro Val Arg Pro Arg Ile Met Glu Ala Glu Ile Ile His Met  
260 265 270

Ile Asp Asn Leu Asp Ala Ser Met Met Met Met Ser Thr Ala Leu Ala  
275 280 285

Leu Val Asp Lys Gly Glu Met Thr Asn Lys Ile Phe Ala Met Asp Asn  
290 295 300

Arg Ser Phe Tyr Lys Pro Asp Leu Asp  
305 310

<210> 74

<211> 503

<212> PRT

<213> Streptococcus pneumoniae

<400> 74

Met Ser Glu Lys Ala Lys Lys Gly Phe Lys Met Pro Ser Ser Tyr Thr  
1 5 10 15

170

Val Leu Leu Ile Ile Ile Ala Ile Met Ala Val Leu Thr Trp Phe Ile  
20 25 30

Pro Ala Gly Ala Phe Ile Glu Gly Ile Tyr Glu Thr Gln Pro Gln Asn  
35 40 45

Pro Gln Gly Ile Trp Asp Val Leu Met Ala Pro Ile Arg Ala Met Leu  
50 55 60

Gly Thr His Pro Glu Glu Gly Ser Leu Ile Lys Glu Thr Ser Ala Ala  
65 70 75 80

Ile Asp Val Ala Phe Phe Ile Leu Met Val Gly Gly Phe Leu Gly Ile  
85 90 95

Val Asn Lys Thr Gly Ala Leu Asp Val Gly Ile Ala Ser Ile Val Lys  
100 105 110

Lys Tyr Lys Gly Arg Glu Lys Met Leu Ile Leu Val Leu Met Pro Leu  
115 120 125

Phe Ala Leu Gly Gly Thr Thr Tyr Gly Met Gly Glu Glu Thr Met Ala  
130 135 140

Phe Tyr Pro Leu Leu Val Pro Val Met Met Ala Val Gly Phe Asp Ser  
145 150 155 160

Leu Thr Gly Val Ala Ile Ile Leu Leu Gly Ser Gln Ile Gly Cys Leu  
165 170 175

Ala Ser Thr Leu Asn Pro Phe Ala Thr Gly Ile Ala Ser Ala Thr Ala  
180 185 190

Gly Val Gly Thr Gly Asp Gly Ile Val Leu Arg Leu Ile Phe Trp Val  
195 200 205

Thr Leu Thr Ala Leu Ser Thr Trp Phe Val Tyr Arg Tyr Ala Asp Lys  
210 215 220

005670 00269960

[illegible]

Gly Leu Ala Ser Ala Thr Met Gly Ile Met Ala Pro Leu Gly Glu Phe  
420 425 430

172

Val Asn Val Arg Pro Ser Leu Ile Ile Thr Ala Tyr Gln Ser Ala Ser  
435 440 445

Gly Val Leu Asn Leu Ile Ala Pro Thr Ser Gly Ile Val Met Gly Ala  
450 455 460

Leu Ala Leu Gly Arg Ile Asn Ile Gly Thr Trp Trp Lys Phe Met Gly  
465 470 475 480

Lys Leu Val Val Ala Ile Ile Val Val Thr Ile Ala Leu Leu Leu Leu  
485 490 495

Gly Thr Phe Leu Pro Phe Leu  
500

<210> 75

<211> 782

<212> PRT

<213> Streptococcus pneumoniae

<400> 75

Met Ser Asn Ser Phe Val Lys Leu Leu Val Ser Gln Leu Phe Ala Asn  
1 5 10 15

Leu Ala Asp Ile Phe Phe Arg Val Thr Ile Ile Ala Asn Ile Tyr Ile  
20 25 30

Ile Ser Lys Ser Val Ile Ala Thr Ser Leu Val Pro Ile Leu Ile Gly  
35 40 45

Ile Ser Ser Phe Val Ala Ser Leu Leu Val Pro Leu Val Thr Lys Arg  
50 55 60

Leu Ala Leu Asn Arg Val Leu Ser Leu Ser Gln Phe Gly Lys Thr Ile  
65 70 75 80

009970 28269260

Phe Leu Ala Ala Lys Trp Glu Pro Gln Leu Phe Thr Pro Asn Leu Lys  
275 280 285

Ile Asp Ser Thr His Phe Thr Thr Tyr Gly Lys Gln Glu Gly Val Ala  
485 490 495

175

Tyr Asn Ala His Tyr Arg Ala His Gly Tyr His Pro Leu Tyr Ala Phe  
500 505 510

Glu Gly Lys Thr Gly Tyr Cys Phe Asn Ala Gln Leu Arg Pro Gly Asn  
515 520 525

Arg Tyr Cys Ser Glu Glu Ala Asp Ser Phe Ile Thr Pro Val Leu Glu  
530 535 540

Arg Phe Asn Gln Leu Leu Phe Arg Met Asp Ser Gly Phe Ala Thr Pro  
545 550 555 560

Lys Leu Tyr Asp Leu Ile Glu Lys Thr Gly Gln Tyr Tyr Leu Ile Lys  
565 570 575

Leu Lys Lys Asn Thr Val Leu Ser Arg Leu Gly Asp Leu Ser Leu Pro  
580 585 590

Cys Pro Gln Asp Glu Asp Leu Thr Ile Leu Pro His Ser Ala Tyr Ser  
595 600 605

Glu Thr Leu Tyr Gln Ala Gly Ser Trp Ser His Lys Arg Arg Val Cys  
610 615 620

Gln Phe Ser Glu Arg Lys Glu Gly Asn Leu Phe Tyr Asp Val Ile Ser  
625 630 635 640

Leu Val Thr Asn Met Thr Ser Gly Thr Ser Gln Asp Gln Phe Gln Leu  
645 650 655

Tyr Arg Gly Arg Gly Gln Ala Glu Asn Phe Ile Lys Glu Met Lys Glu  
660 665 670

Gly Phe Phe Gly Asp Lys Thr Asp Ser Ser Thr Leu Ile Lys Asn Glu  
675 680 685

Val Arg Met Met Met Ser Cys Ile Ala Tyr Asn Leu Tyr Leu Phe Leu  
690 695 700

00759757 012501

[illegible]

Ala Ala Leu Gly Ile Tyr Leu Cys Trp Glu Ile Leu Leu Leu Leu Phe  
65                      70                      75                      80



	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
0	0	1	4	9	16	25	36	49	64	81	100	121	144	169	196	225	256	289	324	361	400	441	484	529	576	625	676	729	784	841	900	961	1024	1089	1156	1225	1296	1369	1444	1521	1600	1681	1764	1849	1936	2025	2116	2209	2304	2401	2500	2601	2704	2809	2916	3025	3136	3249	3364	3481	3600	3721	3844	3969	4096	4225	4356	4489	4624	4761	4900	5041	5184	5329	5476	5625	5776	5929	6084	6241	6400	6561	6724	6889	7056	7225	7396	7569	7744	7921	8100	8281	8464	8649	8836	9025	9216	9409	9604	9801	10000

Asn Lys Pro Phe Leu Ser Arg Asp Leu Lys Glu Phe Trp Asn Arg Trp  
275 280 285

178

His Met Ser Leu Ser Phe Trp Phe Arg Asp Phe Val Phe Met Arg Met  
290 295 300

Val Met Val Leu Thr Arg Lys Lys Val Phe Lys Asn Arg Asn Val Thr  
305 310 315 320

Ser Ser Met Ala Tyr Ile Val Asn Met Leu Ile Met Gly Phe Trp His  
325 330 335

Gly Val Thr Trp Tyr Tyr Ile Ala Tyr Gly Leu Phe His Gly Leu Gly  
340 345 350

Leu Val Ile Asn Asp Ala Trp Val Arg Lys Lys Lys Thr Leu Asn Lys  
355 360 365

Glu Arg Lys Lys Ala Gly Lys Ala Ala Leu Pro Glu Asn Arg Trp Ile  
370 375 380

Gln Leu Leu Gly Met Val Val Thr Phe His Val Val Met Leu Ser Phe  
385 390 395 400

Leu Ile Phe Ser Gly Phe Leu Asn Asn Leu Trp Phe Lys Lys  
405 410

<210> 77

<211> 422

<212> PRT

<213> Streptococcus pneumoniae

<400> 77

Met Leu Lys Arg Leu Trp Met Ile Phe Gly Pro Val Leu Ile Ala Gly  
1 5 10 15

Leu Leu Val Phe Leu Leu Ile Phe Phe Tyr Pro Thr Glu Met His His  
20 25 30

Tyr Val Asn Tyr Asp Lys His Val Ala Lys Tyr Leu Lys Ile Leu Pro  
225                      230                      235                      240

[illegible]

Asp Val Lys Glu Phe Gln  
420

<211> 206

<212> PRT

<213> Streptococcus pneumoniae

<400> 78

Met Glu Lys Asn Leu Lys Ala Leu Lys Gln Thr Thr Asp Gln Glu Gly  
1 5 10 15

Pro Ala Ile Glu Pro Glu Lys Ala Glu Asp Thr Lys Thr Val Gln Asn  
20 25 30

Gly Tyr Phe Glu Asp Ala Ala Val Lys Asp Arg Thr Leu Ser Asp Tyr  
35 40 45

Ala Gly Asn Trp Gln Ser Val Tyr Pro Phe Leu Glu Asp Gly Thr Phe  
50 55 60

Asp Gln Val Phe Asp Tyr Lys Ala Lys Leu Thr Gly Lys Met Thr Gln  
65 70 75 80

Ala Glu Tyr Lys Ala Tyr Tyr Thr Lys Gly Tyr His Thr Asp Val Thr  
85 90 95

Lys Ile Asn Ile Thr Asp Asn Thr Met Glu Phe Val Gln Gly Gly Gln  
100 105 110

Ser Lys Lys Tyr Thr Tyr Lys Tyr Val Gly Lys Lys Ile Leu Thr Tyr  
115 120 125

Lys Lys Gly Asn Arg Gly Val Arg Phe Leu Phe Glu Ala Thr Asp Ala  
130 135 140

Asp Ala Gly Gln Phe Lys Tyr Val Gln Phe Ser Asp His Asn Val Ala  
145 150 155 160

Pro Val Lys Ala Glu His Phe His Ile Phe Phe Gly Gly Thr Ser Gln  
165 170 175

182

Glu Ala Leu Phe Glu Glu Met Asp Asn Trp Pro Thr Tyr Tyr Pro Asp  
180 185 190

Asn Leu Ser Gly Gln Glu Ile Ala Gln Glu Met Leu Ala His  
195 200 205

<210> 79

<211> 147

<212> PRT

<213> Streptococcus pneumoniae

<400> 79

Met Lys Asp Gly His Leu Leu Ala His His Ile Arg Leu Leu Asn Gly  
1 5 10 15

Arg Ile Phe Gln Lys Leu Leu Ser Gln Asp Pro Glu Ala Leu Tyr Arg  
20 25 30

Gly Glu Gln Gly Lys Ile Leu Ala Val Leu Trp Asn Ser Glu Thr Gly  
35 40 45

Cys Ala Thr Ala Thr Asp Ile Ala Leu Ala Thr Gly Leu Ala Asn Asn  
50 55 60

Thr Leu Thr Thr Met Ile Lys Lys Leu Glu Glu Gln Lys Leu Val Ile  
65 70 75 80

Val Ser Pro Cys Gly Lys Asp Lys Arg Lys Lys Tyr Leu Val Leu Thr  
85 90 95

Glu Leu Gly Lys Ser Gln Lys Glu Val Gly His Arg Val Ser Gln Lys  
100 105 110

Leu Asp Thr Ile Phe Tyr Lys Gly Phe Ser Glu Glu Glu Ile His Gln  
115 120 125

103200 030300

Glu Ala Gly Ile Ala Phe Gly Met Thr Arg Trp Glu Arg Leu Lys Lys  
115 120 125

[illegible]

Ala Ala Val Leu Ile Ile Gly Thr Ala Thr Leu Ala Ala Leu Ile Gly  
145                    150                    155                    160

Ala Ser Leu Ile Leu Ile Gly Ala Leu Ser Ser Ala Val Leu Ala Ile  
180 185 190

Ala Phe Asn Phe Leu Leu Lys Val Met Glu Lys Ala Lys Leu Arg Thr  
195 200 205

Ile Phe Ser Gly Phe Ala Leu Val Ala Leu Leu Leu Gly Leu Ser Tyr  
210 215 220

Ser Pro Ala Leu Leu Val Gln Lys Glu Lys Glu Asn Leu Val Ile Ala  
225 230 235 240

Gly Lys Ile Gly Pro Glu Pro Glu Ile Leu Ala Asn Met Tyr Lys Leu  
245 250 255

Leu Ile Glu Glu Asn Thr Ser Met Thr Ala Thr Val Lys Pro Asn Phe  
260 265 270

Gly Lys Thr Ser Phe Leu Tyr Glu Ala Leu Lys Lys Gly Asp Ile Asp  
275 280 285

Ile Tyr Pro Glu Phe Thr Gly Thr Val Thr Glu Ser Leu Leu Gln Pro  
290 295 300

Ser Pro Lys Val Ser His Glu Pro Glu Gln Val Tyr Gln Val Ala Arg  
305 310 315 320

Asp Gly Ile Ala Lys Gln Asp His Leu Ala Tyr Leu Lys Pro Met Ser  
325 330 335



[illegible]

Phe Leu Gln Glu Gln Gly Leu Leu Lys Lys  
500 505

&lt;210&gt; 81

&lt;211&gt; 269

&lt;212&gt; PRT

&lt;213&gt; Streptococcus pneumoniae

&lt;400&gt; 81

Met Met His Thr Tyr Leu Gln Lys Lys Ile Glu Asn Ile Lys Thr Thr

1

5

10

15

Leu Gly Glu Met Ser Gly Gly Tyr Arg Arg Met Val Ala Ala Met Ala

20

25

30

Asp Leu Gly Phe Ser Gly Thr Met Lys Ala Ile Trp Asp Asp Leu Phe

35

40

45

Ala His Arg Ser Phe Ala Gln Trp Ile Tyr Leu Leu Val Leu Gly Ser

50

55

60

Phe Pro Leu Trp Leu Glu Leu Val Tyr Glu His Arg Ile Val Asp Trp

65

70

75

80

Ile Gly Met Ile Cys Ser Leu Thr Gly Ile Ile Cys Val Ile Phe Val

85

90

95

Ser Glu Gly Arg Ala Ser Asn Tyr Leu Phe Gly Leu Ile Asn Ser Val

100

105

110

Ile Tyr Leu Ile Leu Ala Leu Gln Lys Gly Phe Tyr Gly Glu Val Leu

115

120

125

Thr Thr Leu Tyr Phe Thr Val Met Gln Pro Ile Gly Leu Leu Val Trp

130

135

140

Ile Tyr Gln Ala Gln Phe Lys Lys Glu Lys Gln Glu Phe Val Ala Arg

145

150

155

160

Lys Leu Asp Gly Lys Gly Trp Thr Lys Tyr Leu Ser Ile Ser Val Leu

165

170

175

0076030101501

[illegible]

Ala Ile Gly Ile Ser Ala Phe Leu Glu Thr Ile Ser Asn Arg Glu Glu  
50 55 60

188

Asp Asn Gln Tyr Thr Leu Gly Tyr Lys Arg Phe Ser Leu Leu Gly Ala  
65 70 75 80

Leu Val Thr Ala Val Ile Leu Val Thr Gly Ser Val Leu Val Ile Leu  
85 90 95

Glu Asn Val Thr Lys Ile Leu His Pro Gln Pro Val Asn Asp Glu Gly  
100 105 110

Ile Leu Trp Leu Gly Ile Ile Ala Ile Thr Ile Asn Leu Leu Ala Ser  
115 120 125

Leu Val Val Gly Lys Gly Lys Thr Lys Asn Glu Ser Ile Leu Ser Leu  
130 135 140

His Phe Leu Glu Asp Thr Leu Gly Trp Val Ala Val Ile Leu Met Ala  
145 150 155 160

Ile Val Leu Arg Phe Thr Asp Trp Tyr Ile Leu Asp Pro Leu Leu Ser  
165 170 175

Leu Val Ile Ser Phe Phe Ile Leu Ser Lys Ala Leu Pro Arg Phe Trp  
180 185 190

Ser Thr Leu Lys Ile Phe Leu Asp Ala Val Pro Glu Gly Leu Asp Ile  
195 200 205

Lys Gln Val Lys Ser Gly Leu Glu Arg Leu Asp Asn Val Ala Ser Leu  
210 215 220

Asn Gln Leu Asn Leu Trp Thr Met Asp Ala Leu Glu Lys Asn Ala Ile  
225 230 235 240

Val His Val Cys Leu Lys Glu Met Glu His Met Glu Thr Cys Lys Glu  
245 250 255

Ser Ile Arg Ile Phe Leu Lys Asp Cys Gly Phe Gln Asn Ile Thr Ile  
260 265 270

009999.04604

Glu Ile Asp Ala Asp Leu Glu Thr His Gln Thr His Lys Arg Lys Val  
 275 280 285

Cys Asp Leu Glu Arg Ser Tyr Glu His Gln His  
 290 295

<210> 83

<211> 242

<212> PRT

<213> Streptococcus pneumoniae

<400> 83

Met Ile Glu Tyr Lys Asn Val Ala Leu Arg Tyr Thr Glu Lys Asp Val  
 1 5 10 15

Leu Arg Asp Val Asn Leu Gln Ile Glu Asp Gly Glu Phe Met Val Leu  
 20 25 30

Val Gly Pro Ser Gly Ser Gly Lys Thr Thr Met Leu Lys Met Ile Asn  
 35 40 45

Arg Leu Leu Glu Pro Thr Asp Gly Asn Ile Tyr Met Asp Gly Lys Arg  
 50 55 60

Ile Lys Asp Tyr Asp Glu Arg Glu Leu Arg Leu Ser Thr Gly Tyr Val  
 65 70 75 80

Leu Gln Ala Ile Ala Leu Phe Pro Asn Leu Thr Val Ala Glu Asn Ile  
 85 90 95

Ala Leu Ile Pro Glu Met Lys Gly Trp Ser Lys Glu Glu Ile Thr Lys  
 100 105 110

Lys Thr Glu Glu Leu Leu Ala Lys Val Gly Leu Pro Val Ala Glu Tyr  
 115 120 125

Gly His Arg Leu Pro Ser Glu Leu Ser Gly Gly Glu Gln Gln Arg Val  
 130 135 140

004697004000

190

Gly Ile Val Arg Ala Met Ile Gly Gln Pro Lys Ile Phe Leu Met Asp  
145 150 155 160

Glu Pro Phe Ser Ala Leu Asp Ala Ile Ser Arg Lys Gln Leu Gln Val  
165 170 175

Leu Thr Lys Glu Leu His Lys Glu Phe Gly Met Thr Thr Ile Phe Val  
180 185 190

Thr His Asp Thr Asp Glu Ala Leu Lys Leu Ala Asp Arg Ile Ala Val  
195 200 205

Leu Gln Asp Gly Glu Ile Arg Gln Val Ala Asn Pro Glu Thr Ile Leu  
210 215 220

Lys Ala Pro Ala Thr Asp Phe Val Ala Asp Leu Phe Gly Gly Ser Val  
225 230 235 240

His Asp

<210> 84

<211> 360

<212> PRT

<213> Streptococcus pneumoniae

<400> 84

Met Ser Ala Val Ala Ile Ser Ala Met Thr Lys Val Met Gln Glu Thr  
1 5 10 15

His Gly Asn Pro Ser Ser Ile His Gly His Gly Arg Gln Ala Gly Lys  
20 25 30

Leu Leu Arg Glu Ala Arg Gln Glu Leu Ala Gln Leu Leu Arg Thr Lys  
35 40 45

00769797 012604

191

Pro Gln His Ile Phe Phe Thr Ser Gly Gly Thr Glu Gly Asn Asn Thr  
50 55 60

Thr Ile Ile Gly Tyr Cys Leu Arg His Gln Glu Gln Gly Lys His Ile  
65 70 75 80

Ile Thr Thr Ala Ile Glu His His Ala Val Leu Glu Thr Ile Asp Tyr  
85 90 95

Leu Val Gln His Phe Gly Phe Glu Ala Thr Ile Ile Gln Pro Glu Asn  
100 105 110

Gln Glu Ile Thr Ala Gln Gln Ile Gln Lys Ala Leu Arg Asp Asp Thr  
115 120 125

Ile Leu Val Ser Thr Met Phe Val Asn Asn Glu Thr Gly Asn Leu Leu  
130 135 140

Pro Ile Ala Glu Ile Gly Gln Ile Leu Lys Gln His Pro Ala Ala Tyr  
145 150 155 160

His Val Asp Ala Val Gln Ala Ile Gly Lys Ile Pro Ile His Ser Glu  
165 170 175

Glu Leu Gly Ile Asp Phe Leu Thr Ala Ser Ala His Lys Phe His Gly  
180 185 190

Pro Lys Gly Ile Gly Phe Leu Tyr Ala Ser Ser Met Asp Phe Asp Ser  
195 200 205

Tyr Leu His Gly Gly Asp Gln Glu Gln Lys Lys Arg Ala Gly Thr Glu  
210 215 220

Asn Leu Pro Ala Ile Val Gly Met Val Ala Ala Leu Lys Glu Asp Leu  
225 230 235 240

Glu Lys Gln Glu Glu His Phe Gln His Val Gln Asn Leu Glu Thr Ala  
245 250 255

00760707 02504

192

Phe Leu Ala Glu Leu Glu Gly Ile Gln Tyr Tyr Leu Asn Arg Gly Lys  
260 265 270

His His Leu Pro Tyr Val Leu Asn Ile Gly Phe Pro Gly Gln Lys Asn  
275 280 285

Asp Leu Leu Leu Leu Arg Leu Asp Leu Ala Gly Ile Ser Ile Ser Thr  
290 295 300

Gly Ser Ala Cys Thr Ala Gly Val Val Gln Ser Ser His Val Leu Glu  
305 310 315 320

Ala Met Tyr Gly Ala Asn Ser Glu Arg Leu Lys Glu Ser Leu Arg Ile  
325 330 335

Ser Leu Ser Pro Gln Asn Thr Val Glu Asp Leu Gln Thr Leu Ala Lys  
340 345 350

Thr Leu Lys Glu Ile Ile Gly Gly  
355 360

<210> 85

<211> 459

<212> PRT

<213> Streptococcus pneumoniae

<400> 85

Met Leu Phe Lys Leu Ser Lys Glu Lys Ile Glu Leu Gly Leu Ser Arg  
1 5 10 15

Leu Ser Pro Ala Arg Arg Ile Phe Leu Ser Phe Ala Leu Val Ile Leu  
20 25 30

Leu Gly Ser Leu Leu Leu Ser Leu Pro Phe Val Gln Val Glu Ser Ser  
35 40 45

005679-0464  
105679-0464





194

Phe Leu Glu Trp Asn Asn Ala Gly Thr Ile Gly Asn Leu Pro Val Ala  
260 265 270

Asp Lys Val Leu Val Ser Phe Phe Gln Thr Val Thr Met Arg Thr Ala  
275 280 285

Gly Phe Ser Thr Ile Asp Tyr Thr Gln Ala His Pro Val Thr Leu Leu  
290 295 300

Ile Tyr Ile Leu Gln Met Phe Leu Gly Gly Ala Pro Gly Gly Thr Ala  
305 310 315 320

Gly Gly Leu Lys Ile Thr Thr Phe Phe Val Leu Leu Val Phe Ala Arg  
325 330 335

Ser Glu Leu Leu Gly Leu Pro His Ala Asn Val Ala Arg Arg Thr Ile  
340 345 350

Ala Pro Arg Thr Val Gln Lys Ser Phe Ser Val Phe Ile Ile Phe Leu  
355 360 365

Met Ser Phe Leu Ile Gly Leu Ile Leu Leu Gly Ile Thr Ala Lys Gly  
370 375 380

Asn Pro Pro Phe Ile His Leu Val Phe Glu Thr Ile Ser Ala Leu Ser  
385 390 395 400

Thr Val Gly Val Thr Ala Asn Leu Thr Pro Asp Leu Gly Lys Leu Ala  
405 410 415

Leu Ser Val Ile Met Pro Leu Met Phe Met Gly Arg Ile Gly Pro Leu  
420 425 430

Thr Leu Phe Val Ser Leu Ala Asp Tyr His Pro Glu Lys Lys Asp Met  
435 440 445

Ile His Tyr Met Lys Ala Asp Ile Ser Ile Gly  
450 455

007697 01504  
105310 28269260



[illegible]

Ser Gly Arg Tyr Phe Lys Val Val Asp Ser Asp Asp Trp Val Asp Pro  
85 90 95

197

Arg Ala Tyr Leu Lys Ile Leu Glu Thr Leu Gln Glu Leu Glu Ser Lys  
100 105 110

Gly Gln Glu Val Asp Val Phe Val Thr Asn Phe Val Tyr Glu Lys Glu  
115 120 125

Gly Gln Ser Arg Lys Lys Ser Met Ser Tyr Asp Ser Val Leu Pro Val  
130 135 140

Arg Gln Ile Phe Gly Trp Asp Gln Val Gly Asn Phe Ser Lys Gly Gln  
145 150 155 160

Tyr Thr Met Met His Ser Leu Ile Tyr Arg Thr Asp Leu Leu Arg Ala  
165 170 175

Ser Gln Phe

<210> 88

<211> 623

<212> PRT

<213> Streptococcus pneumoniae

<400> 88

Met Lys Phe Asn Pro Asn Gln Arg Tyr Thr Arg Trp Ser Ile Arg Arg  
1 5 10 15

Leu Ser Val Gly Val Ala Ser Val Val Val Ala Ser Gly Phe Phe Val  
20 25 30

Leu Val Gly Gln Pro Ser Ser Val Arg Ala Asp Gly Leu Asn Pro Thr  
35 40 45

Pro Gly Gln Val Leu Pro Glu Glu Thr Ser Gly Thr Lys Glu Gly Asp  
50 55 60

00760787 043604

198

Leu Ser Glu Lys Pro Gly Asp Thr Val Leu Thr Gln Ala Lys Pro Glu  
65 70 75 80

Gly Val Thr Gly Asn Thr Asn Ser Leu Pro Thr Pro Thr Glu Arg Thr  
85 90 95

Glu Val Ser Glu Glu Thr Ser Pro Ser Ser Leu Asp Thr Leu Phe Glu  
100 105 110

Lys Asp Glu Glu Ala Gln Lys Asn Pro Glu Leu Thr Asp Val Leu Lys  
115 120 125

Glu Thr Val Asp Thr Ala Asp Val Asp Gly Thr Gln Ala Ser Pro Ala  
130 135 140

Glu Thr Thr Pro Glu Gln Val Lys Gly Gly Val Lys Glu Asn Thr Lys  
145 150 155 160

Asp Ser Ile Asp Val Pro Ala Ala Tyr Leu Glu Lys Ala Glu Gly Lys  
165 170 175

Gly Pro Phe Thr Ala Gly Val Asn Gln Val Ile Pro Tyr Glu Leu Phe  
180 185 190

Ala Gly Asp Gly Met Leu Thr Arg Leu Leu Leu Lys Ala Ser Asp Asn  
195 200 205

Ala Pro Trp Ser Asp Asn Gly Thr Ala Lys Asn Pro Ala Leu Pro Pro  
210 215 220

Leu Glu Gly Leu Thr Lys Gly Lys Tyr Phe Tyr Glu Val Asp Leu Asn  
225 230 235 240

Gly Asn Thr Val Gly Lys Gln Gly Gln Ala Leu Ile Asp Gln Leu Arg  
245 250 255

Ala Asn Gly Thr Gln Thr Tyr Lys Ala Thr Val Lys Val Tyr Gly Asn  
260 265 270

003693 01360



200

Phe Thr Ala Gly Val Asn His Val Ile Pro Tyr Glu Leu Phe Ala Gly  
485 490 495

Asp Gly Met Leu Thr Arg Leu Leu Leu Lys Ala Ser Asp Lys Ala Pro  
500 505 510

Trp Ser Asp Asn Gly Asp Ala Lys Asn Pro Ala Leu Ser Pro Leu Gly  
515 520 525

Glu Asn Val Lys Thr Lys Gly Gln Tyr Phe Tyr Gln Leu Ala Leu Asp  
530 535 540

Gly Asn Val Ala Gly Lys Glu Lys Gln Ala Leu Ile Asp Gln Phe Arg  
545 550 555 560

Ala Asn Gly Thr Gln Thr Tyr Ser Ala Thr Val Asn Val Tyr Gly Asn  
565 570 575

Lys Asp Gly Lys Pro Asp Leu Asp Asn Ile Val Ala Thr Lys Lys Val  
580 585 590

Thr Ile Asn Ile Asn Gly Leu Ile Ser Lys Glu Thr Val Gln Lys Ala  
595 600 605

Val Ala Asp Asn Val Lys Thr Val Ser Met Phe Gln Gln Pro Thr  
610 615 620

<210> 89

<211> 350

<212> PRT

<213> Streptococcus pneumoniae

<400> 89

Met Lys Leu Lys Ser Tyr Ile Leu Val Gly Tyr Ile Ile Ser Thr Leu

1

5

10

15

003697 013601



201

Leu Thr Ile Leu Val Val Phe Trp Ala Val Gln Lys Met Leu Ile Ala  
20 25 30

Lys Gly Glu Ile Tyr Phe Leu Leu Gly Met Thr Ile Val Ala Ser Leu  
35 40 45

Val Gly Ala Gly Ile Ser Leu Phe Leu Leu Leu Pro Val Phe Thr Ser  
50 55 60

Leu Gly Lys Leu Lys Glu His Ala Lys Arg Val Ala Ala Lys Asp Phe  
65 70 75 80

Pro Ser Asn Leu Glu Val Gln Gly Pro Val Glu Phe Gln Gln Leu Gly  
85 90 95

Gln Thr Phe Asn Glu Met Ser His Asp Leu Gln Val Ser Phe Asp Ser  
100 105 110

Leu Glu Glu Ser Glu Arg Glu Lys Gly Leu Met Ile Ala Gln Leu Ser  
115 120 125

His Asp Ile Lys Thr Pro Ile Thr Ser Ile Gln Ala Thr Val Glu Gly  
130 135 140

Ile Leu Asp Gly Ile Ile Lys Glu Ser Glu Gln Ala His Tyr Leu Ala  
145 150 155 160

Thr Ile Gly Arg Gln Thr Glu Arg Leu Asn Lys Leu Val Glu Glu Leu  
165 170 175

Asn Phe Leu Thr Leu Asn Thr Ala Arg Asn Gln Val Glu Thr Thr Ser  
180 185 190

Lys Asp Ser Ile Phe Leu Asp Lys Leu Leu Ile Glu Cys Met Ser Glu  
195 200 205

Phe Gln Phe Leu Ile Glu Gln Glu Arg Arg Asp Val His Leu Gln Val  
210 215 220

009993 01300  
109210 226960

202

Ile Pro Glu Ser Ala Arg Ile Glu Gly Asp Tyr Ala Lys Leu Ser Arg  
225 230 235 240

Ile Leu Val Asn Leu Val Asp Asn Ala Phe Lys Tyr Ser Ala Pro Gly  
245 250 255

Thr Lys Leu Glu Val Val Ala Lys Leu Glu Lys Asp Gln Leu Ser Ile  
260 265 270

Ser Val Thr Asp Glu Gly Gln Gly Ile Ala Pro Glu Asp Leu Glu Asn  
275 280 285

Ile Phe Lys Arg Leu Tyr Arg Val Glu Thr Ser Arg Asn Met Lys Thr  
290 295 300

Gly Gly His Gly Leu Gly Leu Ala Ile Ala Arg Glu Leu Ala His Gln  
305 310 315 320

Leu Gly Gly Glu Ile Thr Val Ser Ser Gln Tyr Gly Leu Gly Ser Thr  
325 330 335

Phe Thr Leu Val Leu Asn Leu Ser Gly Ser Glu Asn Lys Ala  
340 345 350

<210> 90

<211> 175

<212> PRT

<213> Streptococcus pneumoniae

<400> 90

Met Phe Gly Gln Thr Ala Gln His Gly Leu Thr Asn Ser Leu Lys Asp  
1 5 10 15

Phe Trp Ile Phe Leu Leu Asn Ile Gly Pro Gln Leu Ala Phe Phe Cys  
20 25 30

00369787 013504

203

Gln Met Leu Arg Cys Ser Arg Ser Val Glu Gln Gly Thr Gly Asn His  
35 40 45

Arg Arg Glu Phe Asn Met Ile Gln Gln Ile Phe Ser His Phe Gly Met  
50 55 60

Thr His Leu Gly Gln Ile Lys Leu Val Tyr Gln Glu Ser Ile Asp Leu  
65 70 75 80

Glu Leu Leu Val Asn Ala Leu Asn His His Leu Leu Ile Asp Arg Leu  
85 90 95

Val Leu Thr Pro Asn Gln Ile Thr Ile Glu Ile Asp Arg Gln Ile Val  
100 105 110

His Gly Leu Asp Leu Leu Lys Gly Arg Lys Asp Lys Glu Ile Ile Asp  
115 120 125

Ile Lys Ser Met Phe Arg Gln Leu Glu Leu Ala Ser Thr Gln Gln Ile  
130 135 140

Cys Pro Ile Asn Gln Arg Val His His Gly Ile Leu Ala Phe Gly Glu  
145 150 155 160

Ile Ser Asp Leu Val Pro Ala Lys Asn Leu Pro Asn Arg Gln Asp  
165 170 175

<210> 91

<211> 158

<212> PRT

<213> Streptococcus pneumoniae

<400> 91

Met Glu His Leu Ala Thr Tyr Phe Ser Thr Tyr Gly Gly Ala Phe Phe  
1 5 10 15

00369397 013604

204

Ala Ala Leu Gly Ile Val Leu Ala Val Gly Leu Ser Gly Met Gly Ser  
20 25 30

Ala Tyr Gly Val Gly Lys Ala Gly Gln Ser Ala Ala Ala Leu Leu Lys  
35 40 45

Glu Gln Pro Glu Lys Phe Ala Ser Ala Leu Ile Leu Gln Leu Leu Pro  
50 55 60

Gly Thr Gln Gly Leu Tyr Gly Phe Val Ile Gly Ile Leu Ile Trp Leu  
65 70 75 80

Gln Leu Thr Pro Glu Leu Pro Leu Glu Lys Gly Val Ala Tyr Phe Phe  
85 90 95

Val Ala Leu Pro Ile Ala Ile Val Gly Tyr Phe Ser Ala Lys His Gln  
100 105 110

Gly Asn Val Ala Val Ala Gly Met Gln Ile Leu Ala Lys Arg Pro Lys  
115 120 125

Glu Phe Met Lys Gly Ala Ile Leu Ala Ala Met Val Glu Thr Tyr Ala  
130 135 140

Ile Leu Ala Phe Val Val Ser Phe Ile Leu Thr Leu Arg Val  
145 150 155

<210> 92

<211> 165

<212> PRT

<213> Streptococcus pneumoniae

<400> 92

Met Leu Lys Ser Glu Lys Gln Ser Arg Tyr Gln Met Leu Asn Glu Glu  
1 5 10 15

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205

Leu Ser Phe Leu Leu Glu Gly Glu Thr Asn Val Leu Ala Asn Leu Ser  
20 25 30

Asn Ala Ser Ala Leu Ile Lys Ser Arg Phe Pro Asn Thr Val Phe Ala  
35 40 45

Gly Phe Tyr Leu Phe Asp Gly Lys Glu Leu Val Leu Gly Pro Phe Gln  
50 55 60

Gly Gly Val Ser Cys Ile Arg Ile Ala Leu Gly Lys Gly Val Cys Gly  
65 70 75 80

Glu Ala Ala His Phe Gln Glu Thr Val Ile Val Gly Asp Val Thr Thr  
85 90 95

Tyr Leu Asn Tyr Ile Ser Cys Asp Ser Leu Ala Lys Ser Glu Ile Val  
100 105 110

Val Pro Met Met Lys Asn Gly Gln Leu Leu Gly Val Leu Asp Leu Asp  
115 120 125

Ser Ser Glu Ile Glu Asp Tyr Asp Ala Met Asp Arg Asp Tyr Leu Glu  
130 135 140

Gln Phe Val Ala Ile Leu Leu Glu Lys Thr Ala Trp Asp Phe Thr Met  
145 150 155 160

Phe Glu Glu Lys Ser  
165

00769767-013601

&lt;210&gt; 93

&lt;211&gt; 256

&lt;212&gt; PRT

&lt;213&gt; Streptococcus pneumoniae

&lt;400&gt; 93

Met Ser Val Leu Glu Ile Lys Asp Leu His Val Glu Ile Glu Gly Lys

1

5

10

15

Glu Ile Leu Lys Gly Val Asn Leu Thr Leu Lys Thr Gly Glu Ile Ala

20

25

30

Ala Ile Met Gly Pro Asn Gly Thr Gly Lys Ser Thr Leu Ser Ala Ala

35

40

45

Ile Met Gly Asn Pro Asn Tyr Glu Val Thr Lys Gly Glu Val Leu Phe

50

55

60

Asp Gly Val Asn Ile Leu Glu Leu Glu Val Asp Glu Arg Ala Arg Met

65

70

75

80

Gly Leu Phe Leu Ala Met Gln Tyr Pro Ser Glu Ile Pro Gly Ile Thr

85

90

95

Asn Ala Glu Phe Leu Arg Ala Ala Met Asn Ala Gly Lys Glu Asp Asp

100

105

110

Glu Lys Ile Ser Val Arg Glu Phe Ile Thr Lys Leu Asp Glu Lys Met

115

120

125

Glu Leu Leu Asn Met Lys Glu Glu Met Ala Glu Arg Tyr Leu Asn Glu

130

135

140

Gly Phe Ser Gly Gly Glu Lys Lys Arg Asn Glu Ile Leu Gln Leu Leu

145

150

155

160

Met Leu Glu Pro Thr Phe Ala Leu Leu Asp Glu Ile Asp Ser Gly Leu

165

170

175

00369757-013604

207

Asp Ile Asp Ala Leu Lys Val Val Ser Lys Gly Val Asn Ala Met Arg  
180 185 190

Gly Glu Gly Phe Gly Ala Met Ile Ile Thr His Tyr Gln Arg Leu Leu  
195 200 205

Asn Tyr Ile Thr Pro Asp Val Val His Val Met Met Glu Gly Arg Val  
210 215 220

Val Leu Ser Gly Gly Pro Glu Leu Ala Ala Arg Leu Glu Arg Glu Gly  
225 230 235 240

Tyr Ala Lys Leu Ala Glu Glu Leu Gly Tyr Asp Tyr Lys Glu Glu Leu  
245 250 255

<210> 94

<211> 156

<212> PRT

<213> Streptococcus pneumoniae

<400> 94

Met Pro Tyr Lys Arg Gln Arg Ser Phe Ser Met Ala Leu Ser Lys Leu  
1 5 10 15

Asp Ser Leu Tyr Met Ala Val Val Ala Asp His Ser Lys Asn Pro His  
20 25 30

His Gln Gly Lys Leu Glu Asp Ala Glu Gln Ile Ser Leu Asn Asn Pro  
35 40 45

Thr Cys Gly Asp Val Ile Asn Leu Ser Val Lys Phe Asp Ala Glu Asp  
50 55 60

005679.0460

208

Arg Leu Glu Asp Ile Ala Phe Leu Asn Ser Gly Cys Thr Ile Ser Thr  
65 70 75 80

Ala Ser Ala Ser Met Met Thr Asp Ala Val Leu Gly Lys Thr Lys Gln  
85 90 95

Glu Ile Leu Glu Leu Ala Thr Ile Phe Ser Glu Met Val Gln Gly Gln  
100 105 110

Lys Asp Glu Arg Gln Asp Gln Leu Gly Asp Ala Ala Phe Leu Ser Gly  
115 120 125

Val Ala Lys Phe Pro Gln Arg Ile Lys Cys Ala Thr Leu Ala Trp Asn  
130 135 140

Ala Leu Lys Lys Thr Ile Glu Asn Gln Glu Lys Gln  
145 150 155

<210> 95

<211> 650

<212> PRT

<213> Streptococcus pneumoniae

<400> 95

Met Lys Ile Gln Asp Leu Leu Arg Lys Asp Val Met Leu Leu Asp Leu  
1 5 10 15

Gln Ala Thr Glu Lys Thr Ala Val Ile Asp Glu Met Ile Lys Asn Leu  
20 25 30

Thr Asp His Gly Tyr Val Thr Asp Phe Glu Thr Phe Lys Glu Gly Ile  
35 40 45

Leu Ala Arg Glu Ala Leu Thr Ser Thr Gly Leu Gly Asp Gly Ile Ala  
50 55 60



209

Met Pro His Ser Lys Asn Ala Ala Val Lys Glu Ala Thr Val Leu Phe  
65 70 75 80

Ala Lys Ser Asn Lys Gly Val Asp Tyr Glu Ser Leu Asp Gly Gln Ala  
85 90 95

Thr Asp Leu Phe Phe Met Ile Ala Ala Pro Glu Gly Ala Asn Asp Thr  
100 105 110

His Leu Ala Ala Leu Ala Glu Leu Ser Gln Tyr Leu Met Lys Asp Gly  
115 120 125

Phe Ala Asp Lys Leu Arg Gln Ala Thr Ser Ala Asp Gln Val Ile Glu  
130 135 140

Leu Phe Asp Gln Ala Ser Glu Lys Thr Glu Glu Leu Val Gln Ala Pro  
145 150 155 160

Ala Asn Asp Ser Gly Asp Phe Ile Val Ala Val Thr Ala Cys Thr Thr  
165 170 175

Gly Ile Ala His Thr Tyr Met Ala Gln Glu Ala Leu Gln Lys Val Ala  
180 185 190

Ala Glu Met Gly Val Gly Ile Lys Val Glu Thr Asn Gly Ala Ser Gly  
195 200 205

Val Gly Asn Gln Leu Thr Ala Glu Asp Ile Arg Lys Ala Lys Ala Ile  
210 215 220

Ile Ile Ala Ala Asp Lys Ala Val Glu Met Asp Arg Phe Asp Gly Lys  
225 230 235 240

Pro Leu Ile Asn Arg Pro Val Ala Asp Gly Ile Arg Lys Thr Glu Glu  
245 250 255

Leu Ile Asn Leu Ala Leu Ser Gly Asp Thr Glu Val Tyr Arg Ala Ala  
260 265 270

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210

Asn Gly Ala Lys Ala Ala Thr Ala Ser Asn Glu Lys Gln Ser Leu Gly  
275 280 285

Gly Ala Leu Tyr Lys His Leu Met Ser Gly Val Ser Gln Met Leu Pro  
290 295 300

Phe Val Ile Gly Gly Gly Ile Met Ile Ala Leu Ala Phe Leu Ile Asp  
305 310 315 320

Gly Ala Leu Gly Val Pro Asn Glu Asn Leu Gly Asn Leu Gly Ser Tyr  
325 330 335

His Glu Leu Ala Ser Met Phe Met Lys Ile Gly Gly Ala Ala Phe Gly  
340 345 350

Leu Met Leu Pro Val Phe Ala Gly Tyr Val Ala Tyr Ser Ile Ala Glu  
355 360 365

Lys Pro Gly Leu Val Ala Gly Phe Val Ala Gly Ala Ile Ala Lys Glu  
370 375 380

Gly Phe Ala Phe Gly Lys Ile Pro Tyr Ala Ala Gly Gly Glu Ala Thr  
385 390 395 400

Ser Thr Leu Ala Gly Val Ser Ser Gly Phe Leu Gly Ala Leu Val Gly  
405 410 415

Gly Phe Ile Ala Gly Ala Leu Val Leu Ala Ile Lys Lys Tyr Val Lys  
420 425 430

Val Pro Arg Ser Leu Glu Gly Ala Lys Ser Ile Leu Leu Leu Pro Leu  
435 440 445

Leu Gly Thr Ile Leu Thr Gly Phe Val Met Leu Ala Val Asn Ile Pro  
450 455 460

Met Ala Ala Ile Asn Thr Ala Met Asn Asp Phe Leu Gly Gly Leu Gly  
465 470 475 480

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Figure 1 consists of 12 histograms arranged in a single column. Each histogram represents the distribution of the number of non-zero elements in the vector  $x$  for a specific value of  $n$ . The x-axis for all histograms is labeled 'Number of non-zero elements' and ranges from 0 to 120. The y-axis is labeled 'Frequency' and ranges from 0 to 100. The histograms are labeled with  $n$  values: 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, and 120. As  $n$  increases, the distribution of non-zero elements shifts to the right, indicating that the vector  $x$  contains more non-zero elements as  $n$  increases.

Val Tyr Gly Tyr Leu Arg Lys Pro Gln Ala  
645 650

<211> 767

<213> Streptococcus pneumoniae

Met Ala Asn Lys Asn Thr Ser Thr Thr Arg Arg Arg Pro Ser Lys Ala

15

20

25

30

35

40

45

50

55

60

65

70

75

80

85

90

95

100

105

110

115

120

125

130

135

140

145

150

155

160

165

170

175

[illegible]

Leu Ser Asp Asp Leu Ala Leu Ala Leu Ala Ala Lys Asp Val Arg Ile  
370 375 380

214

Glu Ala Pro Ile Pro Gly Lys Ser Leu Ile Gly Ile Glu Val Pro Asn  
385 390 395 400

Ser Asp Ile Ala Thr Val Ser Phe Arg Glu Leu Trp Glu Gln Ser Gln  
405 410 415

Thr Lys Ala Glu Asn Phe Leu Glu Ile Pro Leu Gly Lys Ala Val Asn  
420 425 430

Gly Thr Ala Arg Ala Phe Asp Leu Ser Lys Met Pro His Leu Leu Val  
435 440 445

Ala Gly Ser Thr Gly Ser Gly Lys Ser Val Ala Val Asn Gly Ile Ile  
450 455 460

Ala Ser Ile Leu Met Lys Ala Arg Pro Asp Gln Val Lys Phe Met Met  
465 470 475 480

Val Asp Pro Lys Met Val Glu Leu Ser Val Tyr Asn Asp Ile Pro His  
485 490 495

Leu Leu Ile Pro Val Val Thr Asn Pro Arg Lys Ala Ser Lys Ala Leu  
500 505 510

Gln Lys Val Val Asp Glu Met Glu Asn Arg Tyr Glu Leu Phe Ala Lys  
515 520 525

Val Gly Val Arg Asn Ile Ala Gly Phe Asn Ala Lys Val Glu Glu Phe  
530 535 540

Asn Ser Gln Ser Glu Tyr Lys Gln Ile Pro Leu Pro Phe Ile Val Val  
545 550 555 560

Ile Val Asp Glu Leu Ala Asp Leu Met Met Val Ala Ser Lys Glu Val  
565 570 575

Glu Asp Ala Ile Ile Arg Leu Gly Gln Lys Ala Arg Ala Ala Gly Ile  
580 585 590

009693 043604

[illegible]

Ile Gly Pro Ala Glu Gly Thr Lys Pro Arg Lys Val Leu Gln Gln  
755 760 765

&lt;210&gt; 97

&lt;211&gt; 175

&lt;212&gt; PRT

&lt;213&gt; Streptococcus pneumoniae

&lt;400&gt; 97

Met Ser Tyr Phe Lys Lys Tyr Lys Phe Asp Lys Ser Gln Phe Lys Leu  
 1 5 10 15

Gly Met Arg Thr Phe Lys Thr Gly Ile Ala Val Phe Leu Val Leu Leu  
 20 25 30

Ile Phe Gly Phe Phe Gly Trp Lys Gly Leu Gln Ile Gly Ala Leu Thr  
 35 40 45

Ala Val Phe Ser Leu Arg Glu Ser Phe Asp Glu Ser Val His Phe Gly  
 50 55 60

Thr Ser Arg Ile Leu Gly Asn Ser Ile Gly Gly Leu Tyr Ala Leu Val  
 65 70 75 80

Phe Phe Leu Leu Asn Thr Phe Phe His Glu Ala Phe Trp Val Thr Leu  
 85 90 95

Val Val Val Pro Ile Cys Thr Met Leu Thr Ile Met Thr Asn Val Ala  
 100 105 110

Met Asn Asn Lys Ala Gly Val Ile Gly Gly Val Ala Ala Met Leu Ile  
 115 120 125

Ile Thr Leu Ser Ile Pro Ser Gly Glu Thr Ile Leu Tyr Val Phe Val  
 130 135 140

Arg Val Leu Glu Thr Phe Met Gly Val Phe Val Ala Ile Ile Val Asn  
 145 150 155 160

Tyr Asp Ile Asp Arg Ile Arg Leu Phe Leu Glu Lys Lys Glu Lys  
 165 170 175

00969787 01301  
 105210 16269260



<211> 156

<212> PRT

<213> Streptococcus pneumoniae

<400> 98

Met Asn Lys Ser Glu His Arg His Gln Leu Ile Arg Ala Leu Ile Thr  
1 5 10 15

Lys Asn Lys Ile His Thr Gln Ala Glu Leu Gln Ala Leu Leu Ala Glu  
20 25 30

Asn Asp Ile Gln Val Thr Gln Ala Thr Leu Ser Arg Asp Ile Lys Asn  
35 40 45

Met Asn Leu Ser Lys Val Arg Glu Glu Asp Ser Ala Tyr Tyr Val Leu  
50 55 60

Asn	Asn	Gly	Ser	Ile	Ser	Lys	Trp	Glu	Lys	Arg	Leu	Glu	Leu	Tyr	Met
65					70					75					80

Glu Asp Ala Leu Val Trp Met Arg Pro Val Gln His Gln Val Leu Leu  
85 90 95

Lys Thr Leu Pro Gly Leu Ala Gln Ser Phe Gly Ser Ile Ile Asp Thr  
100 105 110

Leu Ser Phe Pro Asp Ala Ile Ala Thr Leu Cys Gly Asn Asp Val Cys  
115 120 125

Leu Ile Ile Cys Glu Asp Ala Asp Thr Ala Gln Lys Cys Phe Glu Glu  
130 135 140

Leu Lys Lys Phe Ala Pro Pro Phe Phe Phe Glu Glu  
145 150 155

&lt;210&gt; 99

&lt;211&gt; 495

&lt;212&gt; PRT

&lt;213&gt; Streptococcus pneumoniae

&lt;400&gt; 99

Met Lys Ser Ile Lys Leu Asn Ala Leu Ser Tyr Met Gly Ile Arg Val

1

5

10

15

Leu Asn Ile Ile Phe Pro Ile Leu Thr Gly Thr Tyr Val Ala Arg Val

20

25

30

Leu Asp Arg Thr Asp Tyr Gly Tyr Phe Asn Ser Val Asp Thr Ile Leu

35

40

45

Ser Phe Phe Leu Pro Phe Ala Thr Tyr Gly Val Tyr Asn Tyr Gly Leu

50

55

60

Arg Ala Ile Ser Asn Val Lys Asp Asn Lys Lys Asp Leu Asn Arg Thr

65

70

75

80

Phe Ser Ser Leu Phe Tyr Leu Cys Ile Ala Cys Thr Ile Leu Thr Thr

85

90

95

Ala Val Tyr Ile Leu Ala Tyr Pro Leu Phe Phe Thr Asp Asn Pro Ile

100

105

110

Val Lys Lys Val Tyr Leu Val Met Gly Ile Gln Leu Ile Ala Gln Ile

115

120

125

Phe Ser Ile Glu Trp Val Asn Glu Ala Leu Glu Asn Tyr Ser Phe Leu

130

135

140

Phe Tyr Lys Thr Ala Phe Ile Arg Ile Leu Met Leu Val Ser Ile Phe

145

150

155

160

Leu Phe Val Lys Asn Glu His Asp Ile Val Val Tyr Thr Leu Val Met

165

170

175

00969797-049604

219

Ser Leu Ser Thr Leu Ile Asn Tyr Leu Ile Ser Tyr Phe Trp Ile Lys  
180 185 190

Arg Asp Ile Lys Leu Val Lys Ile His Leu Ser Asp Phe Lys Pro Leu  
195 200 205

Phe Leu Pro Leu Thr Ala Met Leu Val Phe Ala Asn Ala Asn Met Leu  
210 215 220

Phe Thr Phe Leu Asp Arg Leu Phe Leu Val Lys Thr Gly Ile Asp Val  
225 230 235 240

Asn Val Ser Tyr Tyr Thr Ile Ala Gln Arg Ile Val Thr Val Ile Ala  
245 250 255

Gly Val Val Thr Gly Ala Ile Gly Val Ser Val Pro Arg Leu Ser Tyr  
260 265 270

Tyr Leu Gly Lys Gly Asp Lys Glu Ala Tyr Val Ser Leu Val Asn Arg  
275 280 285

Gly Ser Arg Ile Phe Asn Phe Phe Ile Ile Pro Leu Ser Phe Gly Leu  
290 295 300

Met Val Leu Gly Pro Asn Ala Ile Leu Leu Tyr Gly Ser Glu Lys Tyr  
305 310 315 320

Ile Gly Gly Gly Ile Leu Thr Ser Leu Phe Ala Phe Arg Thr Ile Ile  
325 330 335

Leu Ala Leu Asp Thr Ile Leu Gly Ser Gln Ile Leu Phe Thr Asn Gly  
340 345 350

Tyr Glu Lys Arg Ile Thr Val Tyr Thr Val Phe Ala Gly Leu Leu Asn  
355 360 365

Leu Gly Leu Asn Ser Leu Leu Phe Phe Asn His Ile Val Ala Pro Glu  
370 375 380

105210-01504

[illegible]

Glu Asn Val Asp Gln Glu Leu Leu Leu Gly Asp Ile Ala Asp Ile Ser  
35 40 45

[illegible]

Ala Met Glu Glu Gly Arg Asp Val Phe Ala Ile Pro Gly Ser Ile Leu  
245 250 255

222

Asp Gly Leu Ser Asp Gly Cys His His Leu Ile Gln Glu Gly Ala Lys  
260 265 270

Leu Val Thr Ser Gly Gln Asp Val Leu Ala Glu Phe Glu Phe  
275 280 285

<210> 101

<211> 267

<212> PRT

<213> Streptococcus pneumoniae

<400> 101

Met Lys Gln Leu Thr Val Glu Asp Ala Lys Gln Ile Glu Leu Glu Ile  
1 5 10 15

Leu Asp Tyr Ile Asp Thr Leu Cys Lys Lys His Asn Ile Asn Tyr Ile  
20 25 30

Ile Asn Tyr Gly Thr Leu Ile Gly Ala Val Arg His Glu Gly Phe Ile  
35 40 45

Pro Trp Asp Asp Asp Ile Asp Leu Ser Met Pro Arg Glu Asp Tyr Gln  
50 55 60

Arg Phe Ile Asn Ile Phe Gln Lys Glu Lys Ser Lys Tyr Lys Leu Leu  
65 70 75 80

Ser Leu Glu Thr Asp Lys Asn Tyr Phe Asn Asn Phe Ile Lys Ile Thr  
85 90 95

Asp Ser Thr Thr Lys Ile Ile Asp Thr Arg Asn Thr Lys Thr Tyr Glu  
100 105 110

Ser Gly Ile Phe Ile Asp Ile Phe Pro Ile Asp Arg Phe Asp Asp Pro  
115 120 125

223

Lys Val Ile Asp Thr Cys Tyr Lys Leu Glu Ser Phe Lys Leu Leu Ser  
130 135 140

Phe Ser Lys His Lys Asn Ile Val Tyr Lys Asp Ser Leu Leu Lys Asp  
145 150 155 160

Trp Ile Arg Thr Ala Phe Trp Leu Leu Leu Arg Pro Val Ser Pro Arg  
165 170 175

Tyr Phe Ala Asn Lys Ile Glu Lys Glu Ile Gln Lys Tyr Ser Arg Glu  
180 185 190

Asn Gly Gln Tyr Met Ala Phe Ile Pro Ser Lys Phe Lys Glu Lys Glu  
195 200 205

Val Phe Pro Ser Gly Thr Phe Asp Lys Thr Ile Asp Leu Pro Phe Glu  
210 215 220

Asn Leu Ser Leu Pro Ala Pro Glu Lys Phe Asp Thr Ile Leu Thr Gln  
225 230 235 240

Phe Tyr Gly Asp Tyr Met Thr Leu Pro Pro Glu Glu Lys Arg Phe Tyr  
245 250 255

Ser His Glu Phe His Ala Tyr Lys Leu Glu Asp  
260 265

<210> 102

<211> 508

<212> PRT

<213> Streptococcus pneumoniae

<400> 102

Met Ile Lys Ile Asn His Leu Thr Ile Thr Gln Asn Lys Asp Leu Arg  
1 5 10 15

Variable	Mean	SD	Min	Max
Age	38.5	12.5	25	65
Gender	0.5	0.5	0	1
Marital status	0.7	0.5	0	1
Education	12.5	2.5	9	16
Income	1500	500	500	3000
Health status	0.8	0.4	0	1
Smoking status	0.3	0.5	0	1
Alcohol consumption	0.2	0.4	0	1
Exercise frequency	0.5	0.5	0	1
Stress level	0.6	0.5	0	1
Sleep quality	0.7	0.4	0	1
Work satisfaction	0.6	0.5	0	1
Life satisfaction	0.7	0.4	0	1
Depression score	0.3	0.4	0	1
Anxiety score	0.2	0.3	0	1
Quality of life	0.8	0.3	0	1
Healthcare utilization	0.4	0.5	0	1
Health insurance status	0.9	0.3	0	1
Chronic disease status	0.1	0.3	0	1
Family size	2.5	1.5	1	5
Home ownership	0.8	0.4	0	1
Vehicle ownership	0.6	0.5	0	1
Internet usage	0.9	0.3	0	1
Smartphone usage	0.9	0.3	0	1
Travel frequency	0.5	0.5	0	1
Volunteering status	0.2	0.4	0	1
Religious affiliation	0.5	0.5	0	1
Political affiliation	0.5	0.5	0	1
Environmental concern	0.7	0.4	0	1
Community involvement	0.6	0.5	0	1
Neighborhood safety	0.8	0.3	0	1
Local government satisfaction	0.6	0.5	0	1
Local business satisfaction	0.7	0.4	0	1
Local education satisfaction	0.8	0.3	0	1
Local healthcare satisfaction	0.7	0.4	0	1
Local environment satisfaction	0.6	0.5	0	1
Local culture satisfaction	0.8	0.3	0	1
Local history satisfaction	0.7	0.4	0	1
Local infrastructure satisfaction	0.6	0.5	0	1
Local services satisfaction	0.7	0.4	0	1
Local quality of life satisfaction	0.8	0.3	0	1
Local community satisfaction	0.7	0.4	0	1
Local government transparency	0.6	0.5	0	1
Local business transparency	0.7	0.4	0	1
Local education transparency	0.8	0.3	0	1
Local healthcare transparency	0.7	0.4	0	1
Local environment transparency	0.6	0.5	0	1
Local culture transparency	0.8	0.3	0	1
Local history transparency	0.7	0.4	0	1
Local infrastructure transparency	0.6	0.5	0	1
Local services transparency	0.7	0.4	0	1
Local quality of life transparency	0.8	0.3	0	1
Local community transparency	0.7	0.4	0	1
Local government accountability	0.6	0.5	0	1
Local business accountability	0.7	0.4	0	1
Local education accountability	0.8	0.3	0	1
Local healthcare accountability	0.7	0.4	0	1
Local environment accountability	0.6	0.5	0	1
Local culture accountability	0.8	0.3	0	1
Local history accountability	0.7	0.4	0	1
Local infrastructure accountability	0.6	0.5	0	1
Local services accountability	0.7	0.4	0	1
Local quality of life accountability	0.8	0.3	0	1
Local community accountability	0.7	0.4	0	1
Local government effectiveness	0.6	0.5	0	1
Local business effectiveness	0.7	0.4	0	1
Local education effectiveness	0.8	0.3	0	1
Local healthcare effectiveness	0.7	0.4	0	1
Local environment effectiveness	0.6	0.5	0	1
Local culture effectiveness	0.8	0.3	0	1
Local history effectiveness	0.7	0.4	0	1
Local infrastructure effectiveness	0.6	0.5	0	1
Local services effectiveness	0.7	0.4	0	1
Local quality of life effectiveness	0.8	0.3	0	1
Local community effectiveness	0.7	0.4	0	1
Local government impact	0.6	0.5	0	1
Local business impact	0.7	0.4	0	1
Local education impact	0.8	0.3	0	1
Local healthcare impact	0.7	0.4	0	1
Local environment impact	0.6	0.5	0	1
Local culture impact	0.8	0.3	0	1
Local history impact	0.7	0.4	0	1
Local infrastructure impact	0.6	0.5	0	1
Local services impact	0.7	0.4	0	1
Local				

Ala Ile Ile Gly Glu Glu Gly Asn Gly Lys Ser Thr Leu Leu Lys Ile  
35 40 45

Leu Met Gly Glu Ala Leu Ser Asp Phe Thr Ile Lys Gly Asn Ile Gln  
50 55 60

Ser Asp Tyr Gln Ser Leu Ala Tyr Ile Pro Gln Lys Val Pro Glu Asp  
65 70 75 80

Leu Lys Lys Lys Thr Leu His Asp Tyr Phe Phe Leu Asp Ser Ile Asp  
85 90 95

Leu Asp Tyr Ser Ile Leu Tyr Arg Leu Ala Glu Glu Leu His Phe Asp  
100 105 110

Ser Asn Arg Phe Ala Ser Asp Gln Glu Ile Gly Asn Leu Ser Gly Gly  
115 120 125

Glu Ala Leu Lys Ile Gln Leu Ile His Glu Leu Ala Lys Pro Phe Glu  
130 135 140

Ile Leu Phe Leu Asp Glu Pro Ser Asn Asp Leu Asp Leu Glu Thr Val  
145 150 155 160

Asp Trp Leu Lys Gly Gln Ile Gln Lys Thr Arg Gln Thr Val Ile Phe  
165 170 175

Ile Ser His Asp Glu Asp Phe Leu Ser Glu Thr Ala Asp Thr Ile Val  
180 185 190

His Leu Arg Leu Val Lys His Arg Lys Glu Ala Glu Thr Leu Val Glu  
195 200 205

His Leu Asp Tyr Asp Ser Tyr Ser Glu Gln Arg Lys Ala Asn Phe Ala  
210 215 220





226

Lys Leu Leu Leu Leu Asp Leu Val Leu Arg Lys Pro Asn Phe Leu Leu  
435 440 445

Leu Asp Glu Pro Thr Arg Asn Phe Ser Pro Thr Ser Gln Pro Gln Ile  
450 455 460

Arg Lys Leu Phe Ala Thr Tyr Pro Gly Gly Leu Ile Thr Val Ser His  
465 470 475 480

Asp Arg Arg Phe Leu Lys Glu Val Cys Ser Ile Ile Tyr Arg Met Thr  
485 490 495

Glu His Gly Leu Lys Leu Val Asn Leu Glu Asp Leu  
500 505

<210> 103

<211> 237

<212> PRT

<213> Streptococcus pneumoniae

<400> 103

Met Lys Pro Lys Thr Phe Tyr Asn Leu Leu Ala Glu Gln Asn Leu Pro  
1 5 10 15

Leu Ser Asp Gln Gln Lys Glu Gln Phe Glu Arg Tyr Phe Glu Leu Leu  
20 25 30

Val Glu Trp Asn Glu Lys Ile Asn Leu Thr Ala Ile Thr Asp Lys Glu  
35 40 45

Glu Val Tyr Leu Lys His Phe Tyr Asp Ser Ile Ala Pro Ile Leu Gln  
50 55 60

Gly Leu Ile Pro Asn Glu Thr Ile Lys Leu Leu Asp Ile Gly Ala Gly  
65 70 75 80

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227

Ala Gly Phe Pro Ser Leu Pro Met Lys Ile Leu Tyr Pro Glu Leu Asp  
85 90 95

Val Thr Ile Ile Asp Ser Leu Asn Lys Arg Ile Asn Phe Leu Gln Leu  
100 105 110

Leu Ala Gln Glu Leu Asp Leu Asn Gly Val His Phe Tyr His Gly Arg  
115 120 125

Ala Glu Asp Phe Ala Gln Asp Lys Asn Phe Arg Ala Gln Tyr Asp Phe  
130 135 140

Val Thr Ala Arg Ala Val Ala Arg Met Gln Val Leu Ser Glu Leu Thr  
145 150 155 160

Ile Pro Tyr Leu Lys Val Gly Gly Lys Leu Leu Ala Leu Lys Ala Ser  
165 170 175

Asn Ala Pro Glu Glu Leu Leu Glu Ala Lys Asn Ala Leu Asn Leu Leu  
180 185 190

Phe Ser Lys Val Glu Asp Asn Leu Ser Tyr Ala Leu Pro Asn Arg Asp  
195 200 205

Pro Arg Tyr Ile Thr Val Val Glu Lys Lys Lys Glu Thr Pro Asn Lys  
210 215 220

Tyr Pro Arg Lys Ala Gly Met Pro Asn Lys Arg Pro Leu  
225 230 235

<210> 104

<211> 268

<212> PRT

<213> Streptococcus pneumoniae

<400> 104

Met Ser Ile Lys Leu Ile Ala Val Asp Ile Asp Gly Thr Leu Val Asn  
1 5 10 15

228

Ser Gln Lys Glu Ile Thr Pro Glu Val Phe Ser Ala Ile Gln Asp Ala  
20 25 30

Lys Glu Ala Gly Val Lys Val Val Ile Ala Thr Gly Arg Pro Ile Ala  
35 40 45

Gly Val Ala Lys Leu Leu Asp Asp Leu Gln Leu Arg Asp Glu Gly Asp  
50 55 60

Tyr Val Val Thr Phe Asn Gly Ala Leu Val Gln Glu Thr Ala Thr Gly  
65 70 75 80

His Glu Ile Ile Ser Glu Ser Leu Thr Tyr Glu Asp Tyr Leu Asp Met  
85 90 95

Glu Phe Leu Ser Arg Lys Leu Gly Val His Met His Ala Ile Thr Lys  
100 105 110

Asp Gly Ile Tyr Thr Ala Asn Arg Asn Ile Gly Lys Tyr Thr Val His  
115 120 125

Glu Ser Thr Leu Val Ser Met Pro Ile Phe Tyr Arg Thr Pro Glu Glu  
130 135 140

Met Ala Gly Lys Glu Ile Val Lys Cys Met Phe Ile Asp Glu Pro Glu  
145 150 155 160

Ile Leu Asp Ala Ala Ile Glu Lys Ile Pro Ala Glu Phe Tyr Glu Arg  
165 170 175

Tyr Ser Ile Asn Lys Ser Ala Pro Phe Tyr Leu Glu Leu Leu Lys Lys  
180 185 190

Asn Val Asp Lys Gly Ser Ala Ile Thr His Leu Ala Glu Lys Leu Gly  
195 200 205

Leu Thr Lys Asp Glu Thr Met Ala Ile Gly Asp Glu Glu Asn Asp Arg  
210 215 220

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229

Ala Met Leu Glu Val Val Gly Asn Pro Val Val Met Glu Asn Gly Asn  
225 230 235 240

Pro Glu Ile Lys Lys Ile Ala Lys Tyr Ile Thr Lys Thr Asn Asp Glu  
245 250 255

Ser Gly Val Ala His Ala Ile Arg Thr Trp Val Leu  
260 265

<210> 105

<211> 186

<212> PRT

<213> Streptococcus pneumoniae

<400> 105

Met Thr Trp Ile Ile Leu Gly Val Ile Ala Leu Ile Val Ile Phe Val  
1 5 10 15

Ile Val Ser Tyr Asn Gly Leu Val Lys Asn Arg Met Gln Thr Lys Glu  
20 25 30

Ala Trp Ser Gln Ile Asp Val Gln Leu Lys Arg Arg Asn Asp Leu Leu  
35 40 45

Pro Asn Leu Ile Glu Thr Val Lys Gly Tyr Ala Lys Tyr Glu Gly Ser  
50 55 60

Thr Leu Glu Lys Val Ala Glu Leu Arg Asn Gln Val Ala Ala Ala Thr  
65 70 75 80

Ser Pro Ala Glu Ala Met Lys Ala Ser Asp Ala Leu Thr Arg Gln Val  
85 90 95

Ser Gly Ile Phe Ala Val Ala Glu Ser Tyr Pro Asp Leu Lys Ala Ser  
100 105 110

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230

Ala Asn Phe Val Lys Leu Gln Glu Glu Leu Thr Asn Thr Glu Asn Lys  
115 120 125

Ile Ser Tyr Ser Arg Gln Leu Tyr Asn Ser Val Val Ser Asn Tyr Asn  
130 135 140

Val Lys Leu Glu Thr Phe Pro Ser Asn Ile Ile Ala Gly Met Phe Gly  
145 150 155 160

Phe Lys Ala Ala Asp Phe Leu Gln Thr Pro Glu Glu Glu Lys Ser Val  
165 170 175

Pro Lys Val Asp Phe Ser Gly Leu Gly Asp  
180 185

<210> 106

<211> 299

<212> PRT

<213> Streptococcus pneumoniae

<400> 106

Met Leu Phe Asp Gln Ile Ala Ser Asn Lys Arg Lys Thr Trp Ile Leu  
1 5 10 15

Leu Leu Val Phe Phe Leu Leu Leu Ala Leu Val Gly Tyr Ala Val Gly  
20 25 30

Tyr Leu Phe Ile Arg Ser Gly Leu Gly Gly Leu Val Ile Ala Leu Ile  
35 40 45

Ile Gly Phe Ile Tyr Ala Leu Ser Met Ile Phe Gln Ser Thr Glu Ile  
50 55 60

Val Met Ser Met Asn Gly Ala Arg Glu Val Asp Glu Gln Thr Ala Pro  
65 70 75 80

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231

Asp Leu Tyr His Val Val Glu Asp Met Ala Leu Val Ala Gln Ile Pro  
85 90 95

Met Pro Arg Val Phe Ile Ile Asp Asp Pro Ala Leu Asn Ala Phe Ala  
100 105 110

Thr Gly Ser Asn Pro Gln Asn Ala Ala Val Ala Ala Thr Ser Gly Leu  
115 120 125

Leu Ala Ile Met Asn Arg Glu Glu Leu Glu Ala Val Met Gly His Glu  
130 135 140

Val Ser His Ile Arg Asn Tyr Asp Ile Arg Ile Ser Thr Ile Ala Val  
145 150 155 160

Ala Leu Ala Ser Ala Ile Thr Met Leu Ser Ser Met Ala Gly Arg Met  
165 170 175

Met Trp Trp Gly Gly Ala Gly Arg Arg Arg Ser Asp Asp Asp Arg Asp  
180 185 190

Gly Asn Gly Leu Glu Ile Ile Met Leu Val Val Ser Leu Leu Ala Ile  
195 200 205

Val Leu Ala Pro Leu Ala Ala Thr Leu Val Gln Leu Ala Ile Ser Arg  
210 215 220

Gln Arg Glu Phe Leu Ala Asp Ala Ser Ser Val Glu Leu Thr Arg Asn  
225 230 235 240

Pro Gln Gly Met Ile Asn Ala Leu Asp Lys Leu Asp Asn Ser Lys Pro  
245 250 255

Met Ser Arg His Val Asp Asp Ala Ser Ser Ala Leu Tyr Ile Asn Asp  
260 265 270

Pro Lys Lys Gly Gly Gly Phe Gln Lys Leu Phe Tyr Thr His Pro Pro  
275 280 285

00269797.046604

232

Ile Ser Glu Arg Ile Glu Arg Leu Lys Gln Met  
290 295

<210> 107

<211> 180

<212> PRT

<213> Streptococcus pneumoniae

<400> 107

Met Lys Leu Asn Ile Gln Glu Ile Arg Lys Gln Ser Glu Gly Leu Asn  
1 5 10 15

Phe Glu Gln Thr Leu Asp Leu Val Asp Asp Leu Arg Ala Arg Asn Gln  
20 25 30

Glu Ile Leu Asp Val Lys Asp Ile Leu Ala Val Gly Lys Val Gln Tyr  
35 40 45

Glu Asp Arg Met Tyr Phe Leu Asp Tyr Gln Leu Ser Tyr Thr Ile Val  
50 55 60

Leu Ala Ser Ser Arg Ser Met Glu Pro Val Glu Leu Val Glu Ser Tyr  
65 70 75 80

Pro Val Thr Glu Val Phe Met Glu Gly Ala Thr Asn Gln Leu Asp Gln  
85 90 95

Glu Val Leu Asp Asp Asp Leu Val Leu Pro Ile Glu Asn Gly Glu Leu  
100 105 110

Asp Leu Ala Glu Ser Val Ser Asp Asn Ile Leu Leu Asn Ile Pro Ile  
115 120 125

Lys Val Leu Thr Ala Glu Glu Glu Ala Gly Gln Gly Phe Ile Ser Gly  
130 135 140

09769797 043604



233

Asn Asp Trp Gln Ile Met Thr Glu Glu Glu Tyr Gln Ala Gln Lys Ala  
145 150 155 160

Val Lys Lys Glu Glu Asn Ser Pro Phe Ala Gly Leu Gln Gly Leu Phe  
165 170 175

Asp Gly Asp Glu  
180

<210> 108

<211> 177

<212> PRT

<213> Streptococcus pneumoniae

<400> 108

Met Lys Arg Gln Leu Ala Leu Val Val Phe Ser Gly Gly Gln Asp Ser  
1 5 10 15

Thr Thr Cys Leu Phe Trp Val Met Gln His Tyr Glu Thr Val Glu Ala  
20 25 30

Val Thr Phe Ala Tyr Gly Gln Arg His His Leu Glu Ile Gln Ile Thr  
35 40 45

Arg Glu Ile Ala Lys Glu Gln Gly Ile Arg His His Ile Leu Asp Met  
50 55 60

Ser Leu Leu Gly Gln Ile Thr Ala Gln Pro Asp Phe Ala Thr Ile His  
65 70 75 80

Ile Ser Tyr Ile Pro Asp Lys Leu Cys Val Glu Ser Lys Ser Leu Lys  
85 90 95

Leu Tyr Leu Phe Ser Tyr Arg Asn His Gly Asp Phe His Glu Asn Cys  
100 105 110

09769797 045604

234

Ile Asn Thr Ile Gly Lys Asp Leu Val Asn Leu Leu Asp Pro Arg Tyr  
115 120 125

Leu Glu Val Trp Gly Lys Phe Thr Pro Arg Gly Gly Ile Ser Ile Asp  
130 135 140

Pro Tyr Tyr Asn Tyr Gly Lys Gln Gly Thr Lys Tyr Glu Gly Leu Ala  
145 150 155 160

Glu Gln Arg Leu Phe Gln His Asp Leu Tyr Pro Glu Lys Ile Asp Asn  
165 170 175

Arg

<210> 109

<211> 1236

<212> PRT

<213> Streptococcus pneumoniae

<400> 109

Met Thr Glu Thr Val Glu Asp Lys Val Ser His Ser Ile Thr Gly Leu  
1 5 10 15

Asp Ile Leu Lys Gly Ile Val Ala Ala Gly Ala Val Ile Ser Gly Thr  
20 25 30

Val Ala Thr Gln Thr Lys Val Phe Thr Asn Glu Ser Ala Val Leu Glu  
35 40 45

Lys Thr Val Glu Lys Thr Asp Ala Leu Ala Thr Asn Asp Thr Val Val  
50 55 60

Leu Gly Thr Ile Ser Thr Ser Asn Ser Ala Ser Ser Thr Ser Leu Ser  
65 70 75 80

09769787 012501

235

Ala Ser Glu Ser Ala Ser Thr Ser Ala Ser Glu Ser Ala Ser Thr Ser  
85 90 95

Ala Ser Thr Ser Ala Ser Thr Ser Ala Ser Glu Ser Ala Ser Thr Ser  
100 105 110

Ala Ser Thr Ser Ile Ser Ala Ser Ser Thr Val Val Gly Ser Gln Thr  
115 120 125

Ala Ala Ala Thr Glu Ala Thr Ala Lys Lys Val Glu Glu Asp Arg Lys  
130 135 140

Lys Pro Ala Ser Asp Tyr Val Ala Ser Val Thr Asn Val Asn Leu Gln  
145 150 155 160

Ser Tyr Ala Lys Arg Arg Lys Arg Ser Val Asp Ser Ile Glu Gln Leu  
165 170 175

Leu Ala Ser Ile Lys Asn Ala Ala Val Phe Ser Gly Asn Thr Ile Val  
180 185 190

Asn Gly Ala Pro Ala Ile Asn Ala Ser Leu Asn Ile Ala Lys Ser Glu  
195 200 205

Thr Lys Val Tyr Thr Gly Glu Gly Val Asp Ser Val Tyr Arg Val Pro  
210 215 220

Ile Tyr Tyr Lys Leu Lys Val Thr Asn Asp Gly Ser Lys Leu Thr Phe  
225 230 235 240

Thr Tyr Thr Val Thr Tyr Val Asn Pro Lys Thr Asn Asp Leu Gly Asn  
245 250 255

Ile Ser Ser Met Arg Pro Gly Tyr Ser Ile Tyr Asn Ser Gly Thr Ser  
260 265 270

Thr Gln Thr Met Leu Thr Leu Gly Ser Asp Leu Gly Lys Pro Ser Gly  
275 280 285

09769707 04504

236

Val Lys Asn Tyr Ile Thr Asp Lys Asn Gly Arg Gln Val Leu Ser Tyr  
290 295 300

Asn Thr Ser Thr Met Thr Thr Gln Gly Ser Gly Tyr Thr Trp Gly Asn  
305 310 315 320

Gly Ala Gln Met Asn Gly Phe Phe Ala Lys Lys Gly Tyr Gly Leu Thr  
325 330 335

Ser Ser Trp Thr Val Pro Ile Thr Gly Thr Asp Thr Ser Phe Thr Phe  
340 345 350

Thr Pro Tyr Ala Ala Arg Thr Asp Arg Ile Gly Ile Asn Tyr Phe Asn  
355 360 365

Gly Gly Gly Lys Val Val Glu Ser Ser Thr Thr Ser Gln Ser Leu Ser  
370 375 380

Gln Ser Lys Ser Leu Ser Val Ser Ala Ser Gln Ser Ala Ser Ala Ser  
385 390 395 400

Ala Ser Thr Ser Ala Ser Ala Ser Ala Ser Thr Ser Ala Ser Ala Ser  
405 410 415

Ala Ser Thr Ser Ala Ser Ala Ser Ala Ser Thr Ser Ala Ser Val Ser  
420 425 430

Ala Ser Thr Ser Ala Ser Ala Ser Ala Ser Thr Ser Ala Ser Ala Ser  
435 440 445

Ala Ser Thr Ser Ala Ser Glu Ser Ala Ser Thr Ser Ala Ser Ala Ser  
450 455 460

Ala Ser Thr Ser Ala Ser Ala Ser Ala Ser Thr Ser Ala Ser Ala Ser  
465 470 475 480

Ala Ser Thr Ser Ala Ser Glu Ser Ala Ser Thr Ser Ala Ser Ala Ser  
485 490 495

09769787 043604

237

Ala Ser Thr Ser Ala Ser Glu Ser Ala Ser Thr Ser Ala Ser Ala Ser  
500 505 510

Ala Ser Thr Ser Ala Ser Ala Ser Ala Ser Thr Ser Ala Ser Gly Ser  
515 520 525

Ala Ser Thr Ser Thr Ser Ala Ser Ala Ser Thr Ser Ala Ser Ala Ser  
530 535 540

Ala Ser Thr Ser Ala Ser Ala Ser Ala Ser Ile Ser Ala Ser Glu Ser  
545 550 555 560

Ala Ser Thr Ser Ala Ser Glu Ser Ala Ser Thr Ser Thr Ser Ala Ser  
565 570 575

Ala Ser Thr Ser Ala Ser Glu Ser Ala Ser Thr Ser Ala Ser Ala Ser  
580 585 590

Ala Ser Thr Ser Ala Ser Ala Ser Ala Ser Thr Ser Ala Ser Ala Ser  
595 600 605

Ala Ser Thr Ser Ala Ser Ala Ser Thr Ser Ala Ser Glu Ser Ala Ser  
610 615 620

Thr Ser Ala Ser Ala Ser Ala Ser Thr Ser Ala Ser Ala Ser Ala Ser  
625 630 635 640

Thr Ser Ala Ser Ala Ser Ala Ser Thr Ser Ala Ser Ala Ser Ala Ser  
645 650 655

Thr Ser Ala Ser Val Ser Ala Ser Thr Ser Ala Ser Ala Ser Ala Ser  
660 665 670

Thr Ser Ala Ser Ala Ser Ala Ser Thr Ser Ala Ser Glu Ser Ala Ser  
675 680 685

Thr Ser Ala Ser Ala Ser Ala Ser Thr Ser Ala Ser Ala Ser Ala Ser  
690 695 700

0036020204504

238

Thr Ser Ala Ser Ala Ser Ala Ser Thr Ser Ala Ser Glu Ser Ala Ser  
705 710 715 720

Thr Ser Ala Ser Ala Ser Ala Ser Thr Ser Ala Ser Glu Ser Ala Ser  
725 730 735

Thr Ser Ala Ser Ala Ser Ala Ser Thr Ser Ala Ser Ala Ser Ala Ser  
740 745 750

Thr Ser Ala Ser Gly Ser Ala Ser Thr Ser Thr Ser Ala Ser Ala Ser  
755 760 765

Thr Ser Ala Ser Ala Ser Ala Ser Thr Ser Ala Ser Ala Ser Ala Ser  
770 775 780

Ile Ser Ala Ser Glu Ser Ala Ser Thr Ser Ala Ser Glu Ser Ala Ser  
785 790 795 800

Thr Ser Thr Ser Ala Ser Ala Ser Thr Ser Ala Ser Glu Ser Ala Ser  
805 810 815

Thr Ser Ala Ser Ala Ser Ala Ser Thr Ser Ala Ser Ala Ser Ala Ser  
820 825 830

Thr Ser Ala Ser Ala Ser Ala Arg Gln Val Arg Arg Pro Gln Pro Val  
835 840 845

His Leu Asn Arg His Gln Pro Val Arg Gln Pro Gln Gln Val Leu Val  
850 855 860

His Gln Leu Gln His Gln Arg Val His Arg Leu Gln His Gln Pro Val  
865 870 875 880

Pro Arg Leu Gln Arg Gln Pro Val Arg Gln Leu Gln Gln Val Pro Val  
885 890 895

Leu Gln Ser Gln His Gln Gln Val Leu Gln Pro Gln His Arg Gln Val  
900 905 910

09769767 043604

Pro Arg Leu Gln Gln Ala His Gln His Leu Asn Gln Arg Arg Gln Ala  
 915 920 925

Pro Gln Leu Gln Gln Val Pro Val Arg Gln Pro Gln Arg Arg Gln Val  
 930 935 940

Arg Gln Pro Gln Gln Val Leu Val His Gln Leu Gln His Gln Arg Val  
 945 950 955 960

His Arg Leu Arg Arg Gln Pro Val His Gln Ser Gln Gln Val Pro Val  
 965 970 975

Arg Gln Leu Pro His Gln Gln Val Pro Arg Leu Gln Gln Ala Pro Val  
 980 985 990

Arg Arg Leu Gln Gln Val Leu Ala Pro Gln Pro Gln Pro Gln Pro Val  
 995 1000 1005

Arg Gln Pro Gln Gln Val Ser Gln Arg Leu Asn Arg His Gln Arg Val  
 1010 1015 1020

Arg Pro Leu Gln Gln Val Leu Ala Pro Gln Pro Gln Arg Gln Gln Val  
 1025 1030 1035 1040

His Arg Leu Gln Arg Gln Arg Val Arg Leu Asn Arg His Gln Arg Val  
 1045 1050 1055

Arg Pro Leu Gln Gln Val Leu Ala Pro Gln Pro Gln Arg Gln Gln Val  
 1060 1065 1070

His Arg Leu Gln His Gln Arg Val Arg Pro Leu Gln Gln Val Leu Ala  
 1075 1080 1085

Pro Gln Pro Gln Arg Gln Gln Val His Arg Leu Gln Arg Gln Arg Val  
 1090 1095 1100

Arg Leu Ser Gln His Gln Arg Val Arg Gln Pro Gln Gln Ala His Gln  
 1105 1110 1115 1120

00769787 043604





[illegible]

Val Gln Ser Gly Ile Ser Ile Val Ala Met Asn Ile Ser Ile Ser Ile  
245 250 255

242

Met Ala Gly Leu Ala Ile Phe Gln Ala Arg Ser Pro Phe Asn Ile Gln  
260 265 270

Ser Glu Gly Gly Pro Ser Leu Leu Phe Ile Val Leu Pro Gln Leu Phe  
275 280 285

Asp Lys Met Pro Phe Gly Thr Ile Phe Tyr Val Leu Phe Leu Leu Leu  
290 295 300

Phe Leu Phe Ala Thr Val Thr Phe Ser Val Val Met Leu Glu Ile Asn  
305 310 315 320

Val Asp Asn Ile Thr Asn Gln Asp Asn Ser Lys Arg Ala Lys Trp Ser  
325 330 335

Val Ile Leu Gly Ile Leu Thr Phe Val Phe Gly Ile Pro Ser Ala Leu  
340 345 350

Ser Tyr Gly Val Met Ala Asp Val His Ile Phe Gly Lys Thr Phe Phe  
355 360 365

Asp Ala Met Asp Phe Leu Val Ser Asn Leu Leu Met Pro Phe Gly Ala  
370 375 380

Leu Tyr Leu Ser Leu Phe Thr Gly Tyr Ile Phe Lys Lys Ala Leu Ala  
385 390 395 400

Met Glu Glu Leu His Leu Asp Glu Arg Ala Trp Lys Gln Gly Leu Phe  
405 410 415

Gln Val Trp Leu Phe Leu Leu Arg Phe Phe Val Ser Ser Phe Gln Ser  
420 425 430

Ser Ser Leu Trp Ser Ser Leu Pro Asn Leu Cys Asn Gln Lys Gly Leu  
435 440 445

Glu

003693 04504

&lt;210&gt; 111

&lt;211&gt; 186

&lt;212&gt; PRT

&lt;213&gt; Streptococcus pneumoniae

&lt;400&gt; 111

Met Leu Lys Lys Trp Gln Leu Lys Asp Val Ile Leu Leu Ala Phe Leu

1

5

10

15

Ser Ile Phe Phe Gly Gly Val Phe Val Gly Ser Gly Tyr Val Tyr Asn

20

25

30

Ile Leu Ser Leu Leu Leu Thr Pro Leu Gly Leu Gln Ala Phe Ala Asn

35

40

45

Glu Ile Leu Phe Gly Leu Trp Cys Met Ala Ala Pro Ile Ala Ala Ile

50

55

60

Phe Val Pro Arg Val Gly Ser Ala Thr Ile Gly Glu Val Leu Ala Ala

65

70

75

80

Leu Ala Glu Val Leu Tyr Gly Ser Gln Phe Gly Leu Gly Ala Leu Leu

85

90

95

Ser Gly Phe Val Gln Gly Leu Gly Ser Glu Phe Gly Phe Ile Val Thr

100

105

110

Lys Asn Arg Tyr Glu Ser Trp Leu Ser Leu Thr Ala Asn Ser Ile Gly

115

120

125

Ile Thr Leu Val Ser Phe Val Tyr Glu Tyr Ile Lys Leu Gly Tyr Tyr

130

135

140

Ala Phe Ser Leu Pro Phe Val Leu Ser Leu Leu Val Val Arg Phe Ile

145

150

155

160

Ser Val Tyr Phe Phe Cys Thr Ile Leu Val Arg Ala Ile Val Lys Leu

165

170

175

1096970 1866260

244

Tyr His Gln Phe Ala Thr Gly Gly Lys Ala

180

185

<210> 112

<211> 216

<212> PRT

<213> Streptococcus pneumoniae

<400> 112

Met Val Lys Val Ala Thr Gln Thr Pro Ile Ile Ser Leu Phe Leu Leu

1

5

10

15

Ile Leu Ser Leu Glu Thr Ser Phe Ile Pro Ser Ile Ala Leu Thr Leu

20

25

30

Ser Val Val Ala Phe Cys Ile Leu Phe Met Leu Tyr Tyr Arg Arg Phe

35

40

45

Lys Met Leu Ala Trp Met Ile Ile Leu Ala Ile Leu Pro Ser Phe Ala

50

55

60

Asn Tyr Trp Ala Val Gln Leu His Gly Asp Ala Ser Gln Ala Val Met

65

70

75

80

Leu Gly Thr Arg Ala Phe Val Thr Val Cys Ile Gly Leu Val Phe Val

85

90

95

Ser Ser Val Ser Leu Lys Glu Leu Leu Leu Tyr Leu Ala Gln Lys Gly

100

105

110

Leu Ser Arg Ser Trp Ser Tyr Ala Leu Ile Val Val Phe Asn Ser Phe

115

120

125

Pro Leu Ile Gln Gln Glu Ile Lys Ser Leu Lys Glu Ala Cys Leu Leu

130

135

140

0036979.04664  
109270.2825260

245

Arg Gly Gln Glu Leu His Phe Trp Ser Pro Leu Ile Tyr Ser Lys Val  
145 150 155 160

Leu Met Thr Val Phe Arg Trp Arg His Leu Tyr Leu Arg Ala Leu Ser  
165 170 175

Ala His Gly Tyr Asp Glu His Ala Gln Leu Lys Asn Ser Tyr Arg Thr  
180 185 190

Phe Tyr Ile Pro Lys Lys Thr Lys Leu Ile Tyr Leu Leu Phe Phe Leu  
195 200 205

Leu Leu Gln Thr Ser Leu Phe Leu  
210 215

<210> 113

<211> 174

<212> PRT

<213> Streptococcus pneumoniae

<400> 113

Met Arg Lys His Gln Leu Gln Val His Lys Leu Thr Ile Leu Ser Met  
1 5 10 15

Met Ile Ala Leu Asp Val Val Leu Thr Pro Ile Phe Arg Ile Glu Gly  
20 25 30

Met Ala Pro Met Ser Ser Val Val Asn Ile Leu Ala Gly Ile Met Met  
35 40 45

Gly Pro Val Tyr Ala Leu Ala Met Ala Thr Val Thr Ala Phe Ile Arg  
50 55 60

Met Thr Thr Gln Gly Ile Pro Pro Leu Ala Leu Thr Gly Ala Thr Phe  
65 70 75 80

003697 28265260

246

Gly Ala Leu Leu Ala Gly Leu Phe Tyr Lys Tyr Gly Arg Lys Phe His  
85 90 95

Tyr Ser Ala Leu Gly Glu Ile Leu Gly Thr Gly Ile Ile Gly Ser Ile  
100 105 110

Val Ser Tyr Pro Val Met Val Leu Phe Thr Gly Ser Ala Ala Lys Leu  
115 120 125

Ser Trp Phe Ile Tyr Thr Pro Arg Phe Phe Gly Ala Thr Leu Ile Gly  
130 135 140

Thr Ala Ile Ser Phe Ile Ala Phe Arg Phe Leu Ile Lys Gln Glu Phe  
145 150 155 160

Phe Lys Lys Val Gln Gly Tyr Phe Phe Ser Glu Arg Ile Asp  
165 170

<210> 114

<211> 267

<212> PRT

<213> Streptococcus pneumoniae

<400> 114

Met Gln Glu Phe Thr Asn Pro Phe Pro Ile Gly Ser Ser Ser Leu Ile  
1 5 10 15

His Cys Ile Thr Asn Glu Ile Ser Cys Glu Met Leu Ala Asn Gly Ile  
20 25 30

Leu Ala Leu Gly Cys Lys Pro Val Met Ala Asp Asp Ser Arg Glu Val  
35 40 45

Leu Asp Phe Thr Lys Gln Ser Gln Ala Leu Phe Ile Asn Leu Gly His  
50 55 60

007693.01661

247

Leu Ser Ala Glu Lys Glu Lys Ala Ile Arg Met Ala Ala Ser Tyr Ala  
65 70 75 80

Asn Gln Ser Ser Leu Pro Met Val Val Asp Ala Val Gly Val Thr Thr  
85 90 95

Ser Ser Ile Arg Lys Ser Leu Val Lys Asp Leu Leu Asp Tyr Arg Pro  
100 105 110

Thr Val Leu Lys Gly Asn Met Ser Glu Ile Arg Ser Leu Val Gly Leu  
115 120 125

Lys His His Gly Val Gly Val Asp Ala Ser Ala Lys Asp Gln Glu Thr  
130 135 140

Glu Asp Leu Leu Gln Val Leu Lys Asp Trp Cys Gln Thr Tyr Pro Gly  
145 150 155 160

Met Ser Phe Leu Val Thr Gly Pro Lys Asp Leu Val Val Ser Lys Asn  
165 170 175

Gln Val Ala Val Leu Gly Asn Gly Cys Thr Glu Leu Asp Trp Ile Thr  
180 185 190

Gly Thr Gly Asp Leu Val Gly Ala Leu Thr Ala Val Phe Leu Ser Gln  
195 200 205

Gly Lys Thr Gly Phe Glu Ala Ser Cys Leu Ala Val Ser Tyr Leu Asn  
210 215 220

Ile Ala Ala Glu Lys Ile Val Val Gln Gly Met Gly Leu Glu Glu Phe  
225 230 235 240

Arg Tyr Gln Val Leu Asn Gln Leu Ser Leu Leu Arg Arg Asp Glu Asn  
245 250 255

Trp Leu Asp Thr Ile Lys Gly Glu Val Tyr Glu  
260 265

00750787 013504

<211> 277

<212> PRT

<213> Streptococcus pneumoniae

Met Asn His Lys Ile Ala Ile Leu Ser Asp Val His Gly Asn Ala Thr  
1 5 10 15

Ala Leu Glu Ala Val Ile Ala Asp Ala Lys Asn Gln Gly Ala Ser Glu  
20 25 30

Tyr Trp Leu Leu Gly Asp Ile Phe Leu Pro Gly Pro Gly Ala Asn Asp  
35 40 45

Leu Val Ala Leu Leu Lys Asp Leu Pro Ile Thr Ala Ser Val Arg Gly  
50 55 60

Asn Trp Asp Asp Arg Val Leu Glu Ala Leu Asp Gly Gln Tyr Gly Leu  
65 70 75 80

Glu Asp Pro Gln Glu Val Gln Leu Leu Arg Met Thr Gln Tyr Leu Met  
85 90 95

Glu Arg Met Asp Pro Ala Thr Ile Val Trp Leu Arg Ser Leu Pro Leu  
100 105 110

Leu Glu Lys Lys Glu Ile Asp Gly Leu Arg Phe Ser Ile Ser His Asn  
115 120 125

Leu Pro Asp Lys Asn Tyr Gly Gly Asp Leu Leu Val Glu Asn Asp Thr  
130 135 140

Glu Lys Phe Asp Gln Leu Leu Asp Ala Glu Thr Asp Val Ala Val Tyr  
145                      150                      155                      160



[illegible]

Ala Leu Leu Glu Glu Ser Ala Phe Leu Ser Leu Gly Asp Gln Thr Gly  
35 40 45

250

Leu Glu Lys Leu Val Leu Glu Glu Ala Pro Ser Met Arg Thr Arg Lys  
50 55 60

Val Glu Gly Arg Lys Lys Leu Ala Arg Leu Ile Val Lys Val Glu Asn  
65 70 75 80

Pro Leu Glu Ile Glu Gly Ile Leu Ser Lys Thr Asp Ser Ile His Arg  
85 90 95

Leu Tyr Lys Gly Gln Asn Gly Tyr Ala Phe Glu Ile Phe Ser Pro Glu  
100 105 110

Asp Asp Leu Ile Leu Ile His Ala Glu Asp Asp Ile Ala Ser Leu Val  
115 120 125

Glu Val Gly Glu Lys Pro Glu Phe Gln Thr Asp Leu Ala Ser Ile Ser  
130 135 140

Leu Ser Lys Phe Glu Ile Ser Met Glu Leu His Leu Pro Thr Asp Ile  
145 150 155 160

Glu Ser Phe Leu Glu Ser Ser Glu Ile Gly Ala Ser Leu Asp Phe Ile  
165 170 175

Pro Ala Gln Gly Gln Asp Leu Thr Val Asp Asn Thr Val Thr Trp Asp  
180 185 190

Leu Ser Met Leu Lys Phe Leu Val Asn Glu Leu Asp Ile Ala Ser Leu  
195 200 205

Arg Gln Lys Phe Glu Ser Thr Glu Tyr Phe Ile Pro Lys Ser Glu Lys  
210 215 220

Phe Phe Leu Gly Lys Asp Arg Asn Asn Val Glu Leu Trp Phe Glu Glu  
225 230 235 240

Val

09269797 043604

&lt;210&gt; 117

&lt;211&gt; 311

&lt;212&gt; PRT

&lt;213&gt; Streptococcus pneumoniae

&lt;400&gt; 117

Met Lys Trp Thr Lys Ile Ile Lys Lys Ile Glu Glu Gln Ile Glu Ala

1 5 10 15

Gly Ile Tyr Pro Gly Ala Ser Phe Ala Tyr Phe Lys Asp Asn Gln Trp

20 25 30

Thr Glu Phe Tyr Leu Gly Gln Ser Asp Pro Glu His Gly Leu Gln Thr

35 40 45

Glu Ala Gly Leu Val Tyr Asp Leu Ala Ser Val Ser Lys Val Val Gly

50 55 60

Val Gly Thr Val Cys Thr Phe Leu Trp Glu Ile Gly Gln Leu Asp Ile

65 70 75 80

Asp Arg Leu Val Ile Asp Phe Leu Pro Glu Ser Asp Tyr Pro Asp Ile

85 90 95

Thr Ile Arg Gln Leu Leu Thr His Ala Thr Asp Leu Asp Pro Phe Ile

100 105 110

Pro Asn Arg Asp Leu Leu Thr Ala Pro Glu Leu Lys Glu Ala Met Phe

115 120 125

His Leu Asn Arg Arg Ser Gln Pro Ala Phe Leu Tyr Ser Asp Val His

130 135 140

Phe Leu Leu Leu Gly Phe Ile Leu Glu Arg Ile Phe Asn Gln Asp Leu

145 150 155 160

Asp Val Ile Leu Lys Asp Gln Val Trp Lys Pro Trp Gly Met Thr Glu

165 170 175

105210 2826260

252

Thr Lys Phe Gly Pro Val Glu Leu Ala Val Pro Thr Val Arg Gly Val  
180 185 190

Glu Ala Gly Ile Val His Asp Pro Lys Ala Arg Leu Leu Gly Arg His  
195 200 205

Ala Gly Ser Ala Gly Leu Phe Ser Thr Ile Lys Asp Leu Gln Ile Phe  
210 215 220

Leu Glu His Tyr Leu Ala Asp Asp Phe Ala Arg Asp Leu Asn Gln Asn  
225 230 235 240

Phe Ser Pro Leu Asp Asp Lys Glu Arg Ser Leu Ala Trp Asn Leu Glu  
245 250 255

Gly Asp Trp Leu Asp His Thr Gly Tyr Thr Gly Thr Phe Ile Met Trp  
260 265 270

Asn Arg Gln Lys Gln Glu Ala Thr Ile Phe Leu Ser Asn Arg Thr Tyr  
275 280 285

Glu Lys Asp Glu Arg Ala Gln Trp Ile Leu Asp Arg Asn Gln Val Met  
290 295 300

Asn Leu Ile Arg Lys Glu Glu  
305 310

<210> 118

<211> 160

<212> PRT

<213> Streptococcus pneumoniae

<400> 118

Met Met Lys Lys Thr Tyr Asn His Ile Leu Val Trp Gly Val Ile Phe  
1 5 10 15

253

Tyr Ser Ile Cys Ile Val Cys Phe Cys Phe Thr Pro Gln Glu Gln Ser  
20 25 30

Thr Val Gly Val Gly Thr Pro Gly Ile Gln His Leu Gly Arg Leu Val  
35 40 45

Phe Leu Leu Thr Pro Phe Asn Ser Leu Trp Lys Leu Gly Glu Val Ser  
50 55 60

Asp Ile Gly Gln Leu Cys Trp Ile Phe Leu Gln Asn Ile Leu Asn Val  
65 70 75 80

Phe Leu Phe Phe Pro Leu Ile Phe Gln Leu Leu Tyr Leu Phe Pro Asn  
85 90 95

Leu Arg Lys Thr Lys Lys Val Leu Leu Phe Ser Phe Leu Val Ser Leu  
100 105 110

Gly Ile Glu Cys Thr Gln Leu Ile Leu Asp Phe Phe Phe Asp Phe Asn  
115 120 125

Arg Val Phe Glu Ile Asp Asp Leu Trp Thr Asn Thr Leu Gly Gly Tyr  
130 135 140

Leu Ala Trp Leu Leu Tyr Lys Arg Leu His Lys Asn Lys Val Arg Asn  
145 150 155 160

<210> 119

<211> 263

<212> PRT

<213> Streptococcus pneumoniae

<400> 119

Met Lys Ile Pro Leu Leu Thr Phe Ala Arg His Lys Phe Val Tyr Val  
1 5 10 15

005673-013604

254

Leu Leu Thr Leu Leu Phe Leu Ala Leu Val Tyr Arg Asp Val Leu Met  
20 25 30

Thr Tyr Phe Phe Phe Asp Ile His Ala Pro Asp Leu Ala Lys Phe Asp  
35 40 45

Gly Gln Ala Ile Lys Asn Asp Leu Leu Lys Ser Ala Leu Asp Phe Arg  
50 55 60

Ile Leu Gln Phe Asn Leu Gly Phe Tyr Gln Ser Phe Ile Ile Pro Ile  
65 70 75 80

Ile Ile Val Leu Leu Gly Phe Gln Tyr Ile Glu Leu Lys Asn Lys Val  
85 90 95

Leu Arg Leu Ser Ile Gly Arg Glu Val Ser Tyr Gln Gly Leu Lys Arg  
100 105 110

Lys Leu Thr Leu Gln Val Ala Ser Ile Pro Cys Leu Ile Tyr Leu Val  
115 120 125

Thr Val Leu Ile Ile Ala Ile Ile Thr Tyr Phe Phe Gly Thr Phe Ser  
130 135 140

Pro Leu Gly Trp Asn Ser Leu Phe Ser Asp Gly Ser Gly Leu Gln Arg  
145 150 155 160

Leu Leu Asp Gly Glu Ile Lys Ser Tyr Leu Phe Phe Thr Cys Val Leu  
165 170 175

Leu Ile Gly Ile Phe Ile Asn Ala Ile Tyr Phe Leu Gln Ile Val Asp  
180 185 190

Tyr Val Gly Asn Val Thr Arg Ser Ala Ile Thr Tyr Leu Met Phe Leu  
195 200 205

Trp Leu Gly Ser Met Leu Leu Tyr Ser Ala Leu Pro Tyr Tyr Met Val  
210 215 220

0056970-04564

255

Pro Met Thr Ser Leu Met Gln Ala Ser Tyr Gly Asp Val Ser Leu Met  
225 230 235 240

Lys Leu Phe Thr Pro Tyr Ile Leu Tyr Ile Val Pro Tyr Met Val Leu  
245 250 255

Glu Lys Tyr Glu Asp Asn Val  
260

<210> 120

<211> 505

<212> PRT

<213> Streptococcus pneumoniae

<400> 120

Met Phe Lys Val Leu Gln Lys Val Gly Lys Ala Phe Met Leu Pro Ile  
1 5 10 15

Ala Ile Leu Pro Ala Ala Gly Leu Leu Leu Gly Ile Gly Gly Ala Leu  
20 25 30

Ser Asn Pro Thr Thr Ile Ala Thr Tyr Pro Ile Leu Asp Asn Ser Ile  
35 40 45

Phe Gln Ser Ile Phe Gln Val Met Ser Ser Ala Gly Glu Val Val Phe  
50 55 60

Ser Asn Leu Ser Leu Leu Leu Cys Val Gly Leu Cys Ile Gly Leu Ala  
65 70 75 80

Lys Arg Asp Lys Gly Thr Ala Ala Leu Ala Gly Val Thr Gly Tyr Leu  
85 90 95

Val Met Thr Ala Thr Ile Lys Ala Leu Val Lys Leu Phe Met Ala Glu  
100 105 110

005697 043604

Ile Thr Gly Ile Thr Glu Pro Ile Glu Phe Met Phe Leu Phe Val Ser  
305 310 315 320



257

Pro Val Leu Tyr Val Val His Ala Phe Leu Asp Gly Val Ser Phe Phe  
325 330 335

Ile Ala Asp Val Leu Asn Ile Ser Ile Gly Asn Thr Phe Ser Gly Gly  
340 345 350

Val Ile Asp Phe Thr Leu Phe Gly Ile Leu Gln Gly Asn Ala Lys Thr  
355 360 365

Asn Trp Val Leu Gln Ile Pro Phe Gly Leu Ile Trp Ser Val Leu Tyr  
370 375 380

Tyr Ile Ile Phe Arg Trp Phe Ile Thr Gln Phe Asn Val Leu Thr Pro  
385 390 395 400

Gly Arg Gly Glu Glu Val Asp Ser Lys Glu Ile Ser Glu Ser Ala Asp  
405 410 415

Ser Thr Ser Asn Thr Ala Asp Tyr Leu Lys Gln Asp Ser Leu Gln Ile  
420 425 430

Ile Arg Ala Leu Gly Gly Ser Asn Asn Ile Glu Asp Val Asp Ala Cys  
435 440 445

Val Thr Arg Leu Arg Val Ala Val Lys Glu Val Asn Gln Val Asp Lys  
450 455 460

Ala Leu Leu Lys Gln Ile Gly Ala Val Asp Val Leu Glu Val Lys Gly  
465 470 475 480

Gly Ile Gln Ala Ile Tyr Gly Ala Lys Ala Ile Leu Tyr Lys Asn Ser  
485 490 495

Ile Asn Glu Ile Leu Gly Val Asp Asp  
500 505

009697 013604

&lt;210&gt; 121

&lt;211&gt; 442

&lt;212&gt; PRT

&lt;213&gt; Streptococcus pneumoniae

&lt;400&gt; 121

Met Lys Phe Arg Lys Leu Ala Cys Thr Val Leu Ala Gly Ala Ala Val

1

5

10

15

Leu Gly Leu Ala Ala Cys Gly Asn Ser Gly Gly Ser Lys Asp Ala Ala

20

25

30

Lys Ser Gly Gly Asp Gly Ala Lys Thr Glu Ile Thr Trp Trp Ala Phe

35

40

45

Pro Val Phe Thr Gln Glu Lys Thr Gly Asp Gly Val Gly Thr Tyr Glu

50

55

60

Lys Ser Ile Ile Glu Ala Phe Glu Lys Ala Asn Pro Asp Ile Lys Val

65

70

75

80

Lys Leu Glu Thr Ile Asp Phe Lys Ser Gly Pro Glu Lys Ile Thr Thr

85

90

95

Ala Ile Glu Ala Gly Thr Ala Pro Asp Val Leu Phe Asp Ala Pro Gly

100

105

110

Arg Ile Ile Gln Tyr Gly Lys Asn Gly Lys Leu Ala Glu Leu Asn Asp

115

120

125

Leu Phe Thr Asp Glu Phe Val Lys Asp Val Asn Asn Glu Asn Ile Val

130

135

140

Gln Ala Ser Lys Ala Gly Asp Lys Ala Tyr Met Tyr Pro Ile Ser Ser

145

150

155

160

Ala Pro Phe Tyr Met Ala Met Asn Lys Lys Met Leu Glu Asp Ala Gly

165

170

175

009697 013601

259

Val Ala Asn Leu Val Lys Glu Gly Trp Thr Thr Asp Asp Phe Glu Lys  
180 185 190

Val Leu Lys Ala Leu Lys Asp Lys Gly Tyr Thr Pro Gly Ser Leu Phe  
195 200 205

Ser Ser Gly Gln Gly Gly Asp Gln Gly Thr Arg Ala Phe Ile Ser Asn  
210 215 220

Leu Tyr Ser Gly Ser Val Thr Asp Glu Lys Val Ser Lys Tyr Thr Thr  
225 230 235 240

Asp Asp Pro Lys Phe Val Lys Gly Leu Glu Lys Ala Thr Ser Trp Ile  
245 250 255

Lys Asp Asn Leu Ile Asn Asn Gly Ser Gln Phe Asp Gly Gly Ala Asp  
260 265 270

Ile Gln Asn Phe Ala Asn Gly Gln Thr Ser Tyr Thr Ile Leu Trp Ala  
275 280 285

Pro Ala Gln Asn Gly Ile Gln Ala Lys Leu Leu Glu Ala Ser Lys Val  
290 295 300

Glu Val Val Glu Val Pro Phe Pro Ser Asp Glu Gly Lys Pro Ala Leu  
305 310 315 320

Glu Tyr Leu Val Asn Gly Phe Ala Val Phe Asn Asn Lys Asp Asp Lys  
325 330 335

Lys Val Ala Ala Ser Lys Lys Phe Ile Gln Phe Ile Ala Asp Asp Lys  
340 345 350

Glu Trp Gly Pro Lys Asp Val Val Arg Thr Gly Ala Phe Pro Val Arg  
355 360 365

Thr Ser Phe Gly Lys Leu Tyr Glu Asp Lys Arg Met Glu Thr Ile Ser  
370 375 380

005670 012604

260

Gly Trp Thr Gln Tyr Tyr Ser Pro Tyr Tyr Asn Thr Ile Asp Gly Phe  
385 390 395 400

Ala Glu Met Arg Thr Leu Trp Phe Pro Met Leu Gln Ser Val Ser Asn  
405 410 415

Gly Asp Glu Lys Pro Ala Asp Ala Leu Lys Ala Phe Thr Glu Lys Ala  
420 425 430

Asn Glu Thr Ile Lys Lys Ala Met Lys Gln  
435 440

<210> 122

<211> 279

<212> PRT

<213> Streptococcus pneumoniae

<400> 122

Met Gln Ser Thr Glu Lys Lys Pro Leu Thr Ala Phe Thr Val Ile Ser  
1 5 10 15

Thr Ile Ile Leu Leu Leu Leu Thr Val Leu Phe Ile Phe Pro Phe Tyr  
20 25 30

Trp Ile Leu Thr Gly Ala Phe Lys Ser Gln Pro Asp Thr Ile Val Ile  
35 40 45

Pro Pro Gln Trp Phe Pro Lys Met Pro Thr Met Glu Asn Phe Gln Gln  
50 55 60

Leu Met Val Gln Asn Pro Ala Leu Gln Trp Met Trp Asn Ser Val Phe  
65 70 75 80

Ile Ser Leu Val Thr Met Phe Leu Val Cys Ala Thr Ser Ser Leu Ala  
85 90 95

0076937 013604

261

Gly Tyr Val Leu Ala Lys Lys Arg Phe Tyr Gly Gln Arg Ile Leu Phe  
100 105 110

Ala Ile Phe Ile Ala Ala Met Ala Leu Pro Lys Gln Val Val Leu Val  
115 120 125

Pro Leu Val Arg Ile Val Asn Phe Met Gly Ile His Asp Thr Leu Trp  
130 135 140

Ala Val Ile Leu Pro Leu Ile Gly Trp Pro Phe Gly Val Phe Leu Met  
145 150 155 160

Lys Gln Phe Ser Glu Asn Ile Pro Thr Glu Leu Leu Glu Ser Ala Lys  
165 170 175

Ile Asp Gly Cys Gly Glu Ile Arg Thr Phe Trp Ser Val Ala Phe Pro  
180 185 190

Ile Val Lys Pro Gly Phe Ala Ala Leu Ala Ile Phe Thr Phe Ile Asn  
195 200 205

Thr Trp Asn Asp Tyr Phe Met Gln Leu Val Met Leu Thr Ser Arg Asn  
210 215 220

Asn Leu Thr Ile Ser Leu Gly Val Ala Thr Met Gln Ala Glu Met Ala  
225 230 235 240

Thr Asn Tyr Gly Leu Ile Met Ala Gly Ala Ala Leu Ala Ala Val Pro  
245 250 255

Ile Val Thr Val Phe Leu Val Phe Gln Lys Ser Phe Thr Gln Gly Ile  
260 265 270

Thr Met Gly Ala Val Lys Gly  
275

00769787 012504

&lt;210&gt; 123

&lt;211&gt; 216

&lt;212&gt; PRT

&lt;213&gt; Streptococcus pneumoniae

&lt;400&gt; 123

Met Lys Ile Met Phe Lys Asn Phe Asn Asn Ile Leu Leu Asn Arg Lys  
 1 5 10 15

Ile Val Leu Leu Leu Arg Ile Val Leu Met Met Ile Leu Ile Asn His  
 20 25 30

Leu Leu Ser Thr Ala Val Gln Lys Gln Asp Ala Val Ile Phe Phe Lys  
 35 40 45

Arg Glu Leu Ile Ser Ile Phe Ser Tyr Asn Asp Tyr Ser Glu Ala Asn  
 50 55 60

Leu Glu Ile Pro Lys Leu Leu Leu Asn Leu Ser Leu Phe Met Val Gly  
 65 70 75 80

Trp Leu Ser Val Ile Leu Leu Glu Ser Asp Leu Ala Asp His Tyr His  
 85 90 95

His Leu Ile Arg Tyr Gln Ser Ser Ser Phe Phe Asp Tyr Thr Arg Lys  
 100 105 110

Arg Leu Val Val Ile Ser Lys Phe Phe Thr Gln Asp Leu Phe Val Trp  
 115 120 125

Phe Leu Gly Leu Leu Pro Leu Gly Ile His Phe Lys Thr Val Ala Leu  
 130 135 140

Phe Phe Leu Leu Ala Gln Leu Met Met Leu Tyr Leu Leu Leu Ser Tyr  
 145 150 155 160

Leu Ile Ala Leu Ile Ser Ala Gly Ala Gly Phe Ser Phe Phe Leu Tyr  
 165 170 175

009693-013604  
 109693-013604

263

Phe Leu Ala Phe Val Gly Gln Glu Trp Met Met Asp His Ile Val Thr  
180 185 190

Val Tyr Leu Val Leu Leu Ser Leu Leu Val Met Leu Ile Val Ser Arg  
195 200 205

Leu Glu Glu Lys Phe Lys Lys Gly  
210 215

<210> 124

<211> 174

<212> PRT

<213> Streptococcus pneumoniae

<400> 124

Met Gly Lys Gly Glu Met Gly Lys Gly Val Ile Gly Leu Glu Phe Asp  
1 5 10 15

Ser Glu Val Leu Val Asn Lys Ala Pro Thr Leu Gln Leu Ala Asn Gly  
20 25 30

Lys Thr Ala Thr Phe Leu Thr Gln Tyr Asp Ser Lys Thr Leu Leu Phe  
35 40 45

Ala Val Asp Lys Glu Asp Ile Gly Gln Glu Ile Ile Gly Ile Ala Lys  
50 55 60

Gly Ser Ile Glu Ser Met His Asn Leu Pro Val Asn Leu Ala Gly Ala  
65 70 75 80

Arg Val Pro Gly Gly Val Asn Gly Ser Lys Ala Ala Val His Glu Val  
85 90 95

Pro Glu Phe Thr Gly Gly Val Asn Gly Thr Glu Pro Ala Val His Glu  
100 105 110

00769787-043604

Ile Gln Ala Ala Lys Asn Gly Ala Glu Leu Ala Asp Val Thr Ser Glu  
85 90 95



[illegible]

Glu Leu Glu Pro Met Val Leu Ser Glu Ala Val Tyr Ser Thr Ser Leu  
290 295 300

[illegible]

Arg Leu Asp Asn Arg Asp Gly Val Leu Asn Glu Ala Gly Ala Glu Val  
500 505 510

267

Tyr Tyr Leu Trp Thr Ser Phe Glu Asn Met Leu Arg Glu Ile Ala Arg  
515 520 525

Leu Asp Gln Ala Glu Leu Glu Ser Ile Val Val Trp Asn Arg Leu Leu  
530 535 540

Val Tyr Ala Thr Leu Phe Gly Tyr Ala Asp Lys Val Ser His Leu Met  
545 550 555 560

Lys Val His Gln Ile Gln Val Glu Asn Pro Asp Ile Asn Leu Tyr Val  
565 570 575

Ala Tyr Gly Trp His Ser Thr Phe Tyr His Ser Thr Ala Gln Met Ser  
580 585 590

His Tyr Ala Ser Val Ala Asn Thr Ala Ser Thr Tyr Ser Val Ser Ser  
595 600 605

Gly Ser Gly Ser Ser Gly Gly Gly Phe Ser Gly Gly Gly Gly Gly Gly  
610 615 620

Ser Ile Gly Ala Phe  
625

<210> 126

<211> 886

<212> PRT

<213> Streptococcus pneumoniae

<400> 126

Met Lys Lys Val Arg Lys Ile Phe Gln Lys Ala Val Ala Gly Leu Cys  
1 5 10 15

Cys Ile Ser Gln Leu Thr Ala Phe Ser Ser Ile Val Ala Leu Ala Glu  
20 25 30

09769767 012604

Asp Asn Ser Asn Ser Met Ser Asn Ile Arg Asn Lys Asn Ala Arg Arg  
225 230 235 240

269

Ala Glu Arg Ala Gly Glu Ala Thr Arg Ser Leu Ile Asp Lys Ile Thr  
245 250 255

Ser Asp Ser Glu Asn Arg Val Ala Leu Val Thr Tyr Ala Ser Thr Ile  
260 265 270

Phe Asp Gly Thr Glu Phe Thr Val Glu Lys Gly Val Ala Asp Lys Asn  
275 280 285

Gly Lys Arg Leu Asn Asp Ser Leu Phe Trp Asn Tyr Asp Gln Thr Ser  
290 295 300

Phe Thr Thr Asn Thr Lys Asp Tyr Ser Tyr Leu Lys Leu Thr Asn Asp  
305 310 315 320

Lys Asn Asp Ile Val Glu Leu Lys Asn Lys Val Pro Thr Glu Ala Glu  
325 330 335

Asp His Asp Gly Asn Arg Leu Met Tyr Gln Phe Gly Ala Thr Phe Thr  
340 345 350

Gln Lys Ala Leu Met Lys Ala Asp Glu Ile Leu Thr Gln Gln Ala Arg  
355 360 365

Gln Asn Ser Gln Lys Val Ile Phe His Ile Thr Asp Gly Val Pro Thr  
370 375 380

Met Ser Tyr Pro Ile Asn Phe Asn His Ala Thr Phe Ala Pro Ser Tyr  
385 390 395 400

Gln Asn Gln Leu Asn Ala Phe Phe Ser Lys Ser Pro Asn Lys Asp Gly  
405 410 415

Ile Leu Leu Ser Asp Phe Ile Thr Gln Ala Thr Ser Gly Glu His Thr  
420 425 430

Ile Val Arg Gly Asp Gly Gln Ser Tyr Gln Met Phe Thr Asp Lys Thr  
435 440 445

00769767 01501

270

Val Tyr Glu Lys Gly Ala Pro Ala Ala Phe Pro Val Lys Pro Glu Lys  
450 455 460

Tyr Ser Glu Met Lys Ala Ala Gly Tyr Ala Val Ile Gly Asp Pro Ile  
465 470 475 480

Asn Gly Gly Tyr Ile Trp Leu Asn Trp Arg Glu Ser Ile Leu Ala Tyr  
485 490 495

Pro Phe Asn Ser Asn Thr Ala Lys Ile Thr Asn His Gly Asp Pro Thr  
500 505 510

Arg Trp Tyr Tyr Asn Gly Asn Ile Ala Pro Asp Gly Tyr Asp Val Phe  
515 520 525

Thr Val Gly Ile Gly Ile Asn Gly Asp Pro Gly Thr Asp Glu Ala Thr  
530 535 540

Ala Thr Ser Phe Met Gln Ser Ile Ser Ser Lys Pro Glu Asn Tyr Thr  
545 550 555 560

Asn Val Thr Asp Thr Thr Lys Ile Leu Glu Gln Leu Asn Arg Tyr Phe  
565 570 575

His Thr Ile Val Thr Glu Lys Lys Ser Ile Glu Asn Gly Thr Ile Thr  
580 585 590

Asp Pro Met Gly Glu Leu Ile Asp Leu Gln Leu Gly Thr Asp Gly Arg  
595 600 605

Phe Asp Pro Ala Asp Tyr Thr Leu Thr Ala Asn Asp Gly Ser Arg Leu  
610 615 620

Glu Asn Gly Gln Ala Val Gly Gly Pro Gln Asn Asp Gly Gly Leu Leu  
625 630 635 640

Lys Asn Ala Lys Val Leu Tyr Asp Thr Thr Glu Lys Arg Ile Arg Val  
645 650 655

00269787-04564

271

Thr Gly Leu Tyr Leu Gly Thr Asp Glu Lys Val Thr Leu Thr Tyr Asn  
660 665 670

Val Arg Leu Asn Asp Glu Phe Val Ser Asn Lys Phe Tyr Asp Thr Asn  
675 680 685

Gly Arg Thr Thr Leu His Pro Lys Glu Val Glu Gln Asn Thr Val Arg  
690 695 700

Asp Phe Pro Ile Pro Lys Ile Arg Asp Val Arg Lys Tyr Pro Glu Ile  
705 710 715 720

Thr Ile Ser Lys Glu Lys Lys Leu Gly Asp Ile Glu Phe Ile Lys Val  
725 730 735

Asn Lys Asn Asp Lys Lys Pro Leu Arg Gly Ala Val Phe Ser Leu Gln  
740 745 750

Lys Gln His Pro Asp Tyr Pro Asp Ile Tyr Gly Ala Ile Asp Gln Asn  
755 760 765

Gly Thr Tyr Gln Asn Val Arg Thr Gly Glu Asp Gly Lys Leu Thr Phe  
770 775 780

Lys Asn Leu Ser Asp Gly Lys Tyr Arg Leu Phe Glu Asn Ser Glu Pro  
785 790 795 800

Ala Gly Tyr Lys Pro Val Gln Asn Lys Pro Ile Val Ala Phe Gln Ile  
805 810 815

Val Asn Gly Glu Val Arg Asp Val Thr Ser Ile Val Pro Gln Asp Ile  
820 825 830

Pro Ala Gly Tyr Glu Phe Thr Asn Asp Lys His Tyr Ile Thr Asn Glu  
835 840 845

Pro Ile Pro Pro Lys Arg Glu Tyr Pro Arg Thr Gly Gly Ile Gly Met  
850 855 860

00769797 043604

272

Leu Pro Phe Tyr Leu Ile Gly Cys Met Met Met Gly Gly Val Leu Leu  
865 870 875 880

Tyr Thr Arg Lys His Pro  
885

<210> 127

<211> 665

<212> PRT

<213> Streptococcus pneumoniae

<400> 127

Met Lys Ser Ile Asn Lys Phe Leu Thr Met Leu Ala Ala Leu Leu Leu  
1 5 10 15

Thr Ala Ser Ser Leu Phe Ser Ala Ala Thr Val Phe Ala Ala Gly Thr  
20 25 30

Thr Thr Thr Ser Val Thr Val His Lys Leu Leu Ala Thr Asp Gly Asp  
35 40 45

Met Asp Lys Ile Ala Asn Glu Leu Glu Thr Gly Asn Tyr Ala Gly Asn  
50 55 60

Lys Val Gly Val Leu Pro Ala Asn Ala Lys Glu Ile Ala Gly Val Met  
65 70 75 80

Phe Val Trp Thr Asn Thr Asn Asn Glu Ile Ile Asp Glu Asn Gly Gln  
85 90 95

Thr Leu Gly Val Asn Ile Asp Pro Gln Thr Phe Lys Leu Ser Gly Ala  
100 105 110

Met Pro Ala Thr Ala Met Lys Lys Leu Thr Glu Ala Glu Gly Ala Lys  
115 120 125

009697.04360



273

Phe Asn Thr Ala Asn Leu Pro Ala Ala Lys Tyr Lys Ile Tyr Glu Ile  
130 135 140

His Ser Leu Ser Thr Tyr Val Gly Glu Asp Gly Ala Thr Leu Thr Gly  
145 150 155 160

Ser Lys Ala Val Pro Ile Glu Ile Glu Leu Pro Leu Asn Asp Val Val  
165 170 175

Asp Ala His Val Tyr Pro Lys Asn Thr Glu Ala Lys Pro Lys Ile Asp  
180 185 190

Lys Asp Phe Lys Gly Lys Ala Asn Pro Asp Thr Pro Arg Val Asp Lys  
195 200 205

Asp Thr Pro Val Asn His Gln Val Gly Asp Val Val Glu Tyr Glu Ile  
210 215 220

Val Thr Lys Ile Pro Ala Leu Ala Asn Tyr Ala Thr Ala Asn Trp Ser  
225 230 235 240

Asp Arg Met Thr Glu Gly Leu Ala Phe Asn Lys Gly Thr Val Lys Val  
245 250 255

Thr Val Asp Asp Val Ala Leu Glu Ala Gly Asp Tyr Ala Leu Thr Glu  
260 265 270

Val Ala Thr Gly Phe Asp Leu Lys Leu Thr Asp Ala Gly Leu Ala Lys  
275 280 285

Val Asn Asp Gln Asn Ala Glu Lys Thr Val Lys Ile Thr Tyr Ser Ala  
290 295 300

Thr Leu Asn Asp Lys Ala Ile Val Glu Val Pro Glu Ser Asn Asp Val  
305 310 315 320

Thr Phe Asn Tyr Gly Asn Asn Pro Asp His Gly Asn Thr Pro Lys Pro  
325 330 335

00769701 013501

Ala Tyr Asn Ala Ala Val Ile Ala Ala Asn Asn Ala Phe Glu Trp Val  
530 535 540

275

Ala Asp Lys Asp Asn Glu Asn Val Val Lys Leu Val Ser Asp Ala Gln  
545 550 555 560

Gly Arg Phe Glu Ile Thr Gly Leu Leu Ala Gly Thr Tyr Tyr Leu Glu  
565 570 575

Glu Thr Lys Gln Pro Ala Gly Tyr Ala Leu Leu Thr Ser Arg Gln Lys  
580 585 590

Phe Glu Val Thr Ala Thr Ser Tyr Ser Ala Thr Gly Gln Gly Ile Glu  
595 600 605

Tyr Thr Ala Gly Ser Gly Lys Asp Asp Ala Thr Lys Val Val Asn Lys  
610 615 620

Lys Ile Thr Ile Pro Gln Thr Gly Gly Ile Gly Thr Ile Ile Phe Ala  
625 630 635 640

Val Ala Gly Ala Ala Ile Met Gly Ile Ala Val Tyr Ala Tyr Val Lys  
645 650 655

Asn Asn Lys Asp Glu Asp Gln Leu Ala  
660 665

<210> 128

<211> 390

<212> PRT

<213> Streptococcus pneumoniae

<400> 128

Met Thr Met Gln Lys Met Gln Lys Met Ile Ser Arg Ile Phe Phe Val  
1 5 10 15

Met Ala Leu Cys Phe Ser Leu Val Trp Gly Ala His Ala Val Gln Ala  
20 25 30

00769787 043604

Asn Tyr Arg Phe Lys Glu Val Glu Pro Leu Ala Gly Tyr Ala Val Thr  
225 230 235 240

277

Thr Leu Asp Thr Asp Val Gln Leu Val Asp His Gln Leu Val Thr Ile  
245 250 255

Thr Val Val Asn Gln Lys Leu Pro Arg Gly Asn Val Asp Phe Met Lys  
260 265 270

Val Asp Gly Arg Thr Asn Thr Ser Leu Gln Gly Ala Met Phe Lys Val  
275 280 285

Met Lys Glu Glu Ser Gly His Tyr Thr Pro Val Leu Gln Asn Gly Lys  
290 295 300

Glu Val Val Val Thr Ser Gly Lys Asp Gly Arg Phe Arg Val Glu Gly  
305 310 315 320

Leu Glu Tyr Gly Thr Tyr Tyr Leu Trp Glu Leu Gln Ala Pro Thr Gly  
325 330 335

Tyr Val Gln Leu Thr Ser Pro Val Ser Phe Thr Ile Gly Lys Asp Thr  
340 345 350

Arg Lys Glu Leu Val Thr Val Val Lys Asn Asn Lys Arg Pro Arg Ile  
355 360 365

Asp Val Pro Asp Thr Gly Glu Glu Thr Leu Val Tyr Leu Asp Ala Cys  
370 375 380

Cys His Phe Val Val Trp  
385 390

00760787 012501

&lt;210&gt; 129

&lt;211&gt; 521

&lt;212&gt; PRT

&lt;213&gt; Streptococcus pneumoniae

&lt;400&gt; 129

Met Ser His Ile Tyr Leu Ser Ile Phe Thr Ser Leu Leu Leu Met Leu

1

5

10

15

Gly Leu Val Asn Val Ala Gln Ala Asp Glu Tyr Leu Arg Ile Gly Met

20

25

30

Glu Ala Ala Tyr Ala Pro Phe Asn Trp Thr Gln Asp Asp Asp Ser Asn

35

40

45

Gly Ala Val Lys Ile Asp Gly Thr Asn Gln Tyr Ala Asn Gly Tyr Asp

50

55

60

Val Gln Ile Ala Lys Lys Ile Ala Lys Asp Leu Gly Lys Glu Pro Leu

65

70

75

80

Val Val Lys Thr Lys Trp Glu Gly Leu Val Pro Ala Leu Thr Ser Gly

85

90

95

Lys Ile Asp Met Ile Ile Ala Gly Met Ser Pro Thr Ala Glu Arg Lys

100

105

110

Gln Glu Ile Ala Phe Ser Ser Ser Tyr Tyr Thr Ser Glu Pro Val Leu

115

120

125

Leu Val Lys Lys Asp Ser Ala Tyr Ala Ser Ala Lys Ser Leu Asp Asp

130

135

140

Phe Asn Gly Ala Lys Ile Thr Ser Gln Gln Gly Val Tyr Leu Tyr Asn

145

150

155

160

Leu Ile Ala Gln Ile Pro Gly Ala Lys Lys Glu Thr Ala Met Gly Asp

165

170

175

007693 0154

[illegible]

Ala Phe Gly Ile Asn Leu Asp Arg Thr Leu Ala Ala Ile Phe Ile Val  
370 375 380

[illegible]

Met Thr Gln Ala Ile Leu Glu Ile Lys His Leu Lys Lys Ser Tyr Gly  
1 5 10 15



Figure 1 consists of 12 scatter plots, labeled (a) through (l), each showing the relationship between a specific variable and the number of children. The variables are: (a) Age, (b) Sex, (c) Education, (d) Income, (e) Religion, (f) Ethnicity, (g) Marital status, (h) Health status, (i) Employment status, (j) Social capital, (k) Parental involvement, and (l) Parental satisfaction. Each plot has a y-axis representing the number of children (ranging from 0 to 10) and an x-axis representing the variable. The plots show various trends: (a) Age shows a positive correlation; (b) Sex shows a positive correlation; (c) Education shows a negative correlation; (d) Income shows a positive correlation; (e) Religion shows a positive correlation; (f) Ethnicity shows a positive correlation; (g) Marital status shows a positive correlation; (h) Health status shows a positive correlation; (i) Employment status shows a positive correlation; (j) Social capital shows a positive correlation; (k) Parental involvement shows a positive correlation; and (l) Parental satisfaction shows a positive correlation.

His Arg Val Ile Phe Met Asp Lys Gly Val Ile Ala Glu Glu Gly Lys  
210 215 220

Leu Gln Arg Tyr Leu Lys  
245

<211> 229

<212> PRT

<213> Streptococcus pneumoniae

<400> 131

Met Lys Lys Tyr Gln Leu Leu Phe Lys Ile Ser Ala Val Phe Ser Tyr  
1 5 10 15

Leu Phe Phe Val Phe Ser Leu Ser Gln Leu Thr Leu Ile Val Gln Asn  
20 25 30

Tyr Trp Gln Phe Ser Ser Gln Ile Gly Asn Leu Phe Trp Ile Gln Asn  
35 40 45

Ile Leu Ser Leu Leu Phe Ile Gly Val Met Ile Val Val Leu Val Lys  
50 55 60

Thr Gly His Gly Tyr Leu Phe Arg Ile Pro Arg Lys Lys Trp Leu Trp  
65 70 75 80

Tyr Ser Ile Leu Thr Val Leu Val Leu Val Phe Gln Ile Ser Phe Asn  
85 90 95

Val Gln Thr Ala Lys His Val Gln Ser Thr Ala Glu Gly Trp Ala Val  
100 105 110

Leu Ile Gly Tyr Ser Gly Thr Asn Phe Ala Glu Leu Gly Ile Tyr Ile  
115 120 125

283

Ala Leu Phe Phe Leu Val Pro Leu Met Glu Glu Leu Ile Tyr Arg Gly  
130 135 140

Leu Leu Gln His Ala Phe Phe Lys His Ser Arg Phe Gly Leu Asp Leu  
145 150 155 160

Leu Leu Pro Ser Ile Leu Phe Ala Leu Pro His Phe Ser Ser Leu Pro  
165 170 175

Ser Leu Leu Asp Ile Phe Val Phe Ala Thr Val Gly Ile Ile Phe Ala  
180 185 190

Gly Leu Thr Arg Tyr Thr Lys Ser Ile Tyr Pro Ser Tyr Ala Val His  
195 200 205

Val Ile Asn Asn Ile Val Ala Thr Phe Pro Phe Leu Leu Thr Phe Leu  
210 215 220

His Arg Val Leu Gly  
225

<210> 132

<211> 350

<212> PRT

<213> Streptococcus pneumoniae

<400> 132

Met Asn Lys Lys Gln Trp Leu Gly Leu Gly Leu Val Ala Val Ala Ala  
1 5 10 15

Val Gly Leu Ala Ala Cys Gly Asn Arg Ser Ser Arg Asn Ala Ala Ser  
20 25 30

Ser Ser Asp Val Lys Thr Lys Ala Ala Ile Val Thr Asp Thr Gly Gly  
35 40 45

09769767.043604

284

Val Asp Asp Lys Ser Phe Asn Gln Ser Ala Trp Glu Gly Leu Gln Ala  
50 55 60

Trp Gly Lys Glu His Asn Leu Ser Lys Asp Asn Gly Phe Thr Tyr Phe  
65 70 75 80

Gln Ser Thr Ser Glu Ala Asp Tyr Ala Asn Asn Leu Gln Gln Ala Ala  
85 90 95

Gly Ser Tyr Asn Leu Ile Phe Gly Val Gly Phe Ala Leu Asn Asn Ala  
100 105 110

Val Lys Asp Ala Ala Lys Glu His Thr Asp Leu Asn Tyr Val Leu Ile  
115 120 125

Asp Asp Val Ile Lys Asp Gln Lys Asn Val Ala Ser Val Thr Phe Ala  
130 135 140

Asp Asn Glu Ser Gly Tyr Leu Ala Gly Val Ala Ala Ala Lys Thr Thr  
145 150 155 160

Lys Thr Lys Gln Val Gly Phe Val Gly Gly Ile Glu Ser Glu Val Ile  
165 170 175

Ser Arg Phe Glu Ala Gly Phe Lys Ala Gly Val Ala Ser Val Asp Pro  
180 185 190

Ser Ile Lys Val Gln Val Asp Tyr Ala Gly Ser Phe Gly Asp Ala Ala  
195 200 205

Lys Gly Lys Thr Ile Ala Ala Ala Gln Tyr Ala Ala Gly Ala Asp Ile  
210 215 220

Val Tyr Gln Val Ala Gly Gly Thr Gly Ala Gly Val Phe Ala Glu Ala  
225 230 235 240

Lys Ser Leu Asn Glu Ser Arg Pro Glu Asn Glu Lys Val Trp Val Ile  
245 250 255

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Figure 1: Schematic representation of the experimental design. The figure is divided into two main sections: 'Pre-treatment' and 'Treatment'. The 'Pre-treatment' section shows a timeline from 0 to 120 minutes, with 'Pre-treatment' and 'Pre-treatment' labels. The 'Treatment' section shows a timeline from 0 to 120 minutes, with 'Treatment' and 'Treatment' labels. The 'Pre-treatment' section includes a 'Pre-treatment' label and a 'Pre-treatment' label. The 'Treatment' section includes a 'Treatment' label and a 'Treatment' label. The figure shows the timing of various treatments and measurements.

Arg Gly Ile Gly Glu Ile Phe Arg Ala Met Gly Pro Leu Val Leu Ile  
50 55 60

286

Gly Leu Gly Phe Ala Val Ala Ser Arg Ala Gly Phe Phe Asn Val Gly  
65 70 75 80

Leu Pro Gly Gln Ala Leu Ala Gly Trp Ile Leu Ser Gly Trp Phe Ala  
85 90 95

Leu Ser His Pro Asp Met Pro Arg Pro Leu Met Ile Leu Ala Thr Ile  
100 105 110

Val Ile Ala Leu Ile Ala Gly Gly Ile Val Gly Ala Ile Pro Gly Ile  
115 120 125

Leu Arg Ala Tyr Leu Gly Thr Ser Glu Val Ile Val Thr Ile Met Met  
130 135 140

Asn Tyr Ile Val Leu Tyr Val Gly Asn Ala Phe Ile His Ala Phe Pro  
145 150 155 160

Lys Asp Phe Met Gln Ser Thr Asp Ser Thr Ile Arg Val Gly Ala Asn  
165 170 175

Ala Thr Tyr Gln Thr Pro Trp Leu Ala Glu Leu Thr Gly Asn Ser Arg  
180 185 190

Met Asn Ile Gly Ile Phe Phe Ala Ile Ile Ala Val Ala Val Ile Trp  
195 200 205

Phe Met Leu Lys Lys Thr Thr Leu Gly Phe Glu Ile Arg Ala Val Gly  
210 215 220

Leu Asn Pro His Ala Ser Glu Tyr Ala Gly Ile Ser Ala Lys Arg Thr  
225 230 235 240

Ile Ile Leu Ser Met Ile Ile Ser Gly Ala Leu Ala Gly Leu Gly Gly  
245 250 255

Ala Val Glu Gly Leu Gly Thr Phe Gln Asn Val Tyr Val Gln Gly Ser  
260 265 270

09769787 04504

287

Ser Leu Ala Ile Gly Phe Asn Gly Met Ala Val Ser Leu Leu Ala Ala  
275 280 285

Asn Ser Pro Ile Gly Ile Leu Phe Ala Ala Phe Leu Phe Gly Val Leu  
290 295 300

Gln Val Gly Ala Pro Gly Met Asn Ala Ala Gln Val Pro Ser Glu Leu  
305 310 315 320

Val Ser Ile Val Thr Ala Ser Ile Ile Phe Phe Val Ser Val His Tyr  
325 330 335

Leu Ile Glu Arg Phe Val Lys Pro Lys Lys Gln Val Lys Gly Gly Lys  
340 345 350

<210> 134

<211> 276

<212> PRT

<213> Streptococcus pneumoniae

<400> 134

Met Gly Val Lys Lys Lys Leu Lys Leu Thr Ser Leu Leu Gly Leu Ser  
1 5 10 15

Leu Leu Ile Met Thr Ala Cys Ala Thr Asn Gly Val Thr Ser Asp Ile  
20 25 30

Thr Ala Glu Ser Ala Asp Phe Trp Ser Lys Leu Val Tyr Phe Phe Ala  
35 40 45

Glu Ile Ile Arg Phe Leu Ser Phe Asp Ile Ser Ile Gly Val Gly Ile  
50 55 60

Ile Leu Phe Thr Val Leu Ile Arg Thr Val Leu Leu Pro Val Phe Gln  
65 70 75 80

09769797-01604

288

Val Gln Met Val Ala Ser Arg Lys Met Gln Glu Ala Gln Pro Arg Ile  
85 90 95

Lys Ala Leu Arg Glu Gln Tyr Pro Gly Arg Asp Met Glu Ser Arg Thr  
100 105 110

Lys Leu Glu Gln Glu Met Arg Lys Val Phe Lys Glu Met Gly Val Arg  
115 120 125

Gln Ser Asp Ser Leu Trp Pro Ile Leu Ile Gln Met Pro Val Ile Leu  
130 135 140

Ala Leu Phe Gln Ala Leu Ser Arg Val Asp Phe Leu Lys Thr Gly His  
145 150 155 160

Phe Leu Trp Ile Asn Leu Gly Ser Val Asp Thr Thr Leu Val Leu Pro  
165 170 175

Ile Leu Ala Ala Val Phe Thr Phe Leu Ser Thr Trp Leu Ser Asn Lys  
180 185 190

Ala Leu Ser Glu Arg Asn Gly Ala Thr Thr Ala Met Met Tyr Gly Ile  
195 200 205

Pro Val Leu Ile Phe Ile Phe Ala Val Tyr Ala Pro Gly Gly Val Ala  
210 215 220

Leu Tyr Trp Thr Val Ser Asn Ala Tyr Gln Val Leu Gln Thr Tyr Phe  
225 230 235 240

Leu Asn Asn Pro Phe Lys Ile Ile Ala Glu Arg Glu Ala Val Val Gln  
245 250 255

Ala Gln Lys Asp Leu Glu Asn Arg Lys Arg Lys Ala Lys Lys Lys Ala  
260 265 270

Gln Lys Thr Lys  
275

00769787-04664



&lt;210&gt; 135

&lt;211&gt; 264

&lt;212&gt; PRT

&lt;213&gt; Streptococcus pneumoniae

&lt;400&gt; 135

Met Val Ile Asp Pro Phe Ala Ile Asn Glu Leu Asp Tyr Tyr Leu Val  
 1 5 10 15

Ser His Phe His Ser Asp His Ile Asp Pro Tyr Thr Ala Ala Ala Ile  
 20 25 30

Leu Asn Asn Pro Lys Leu Glu His Val Lys Phe Ile Gly Pro Tyr His  
 35 40 45

Cys Gly Arg Ile Trp Glu Gly Trp Gly Val Pro Lys Glu Arg Ile Ile  
 50 55 60

Val Val Lys Pro Gly Asp Thr Ile Glu Leu Lys Asp Met Lys Ile His  
 65 70 75 80

Ala Val Glu Ser Phe Asp Arg Thr Cys Leu Val Thr Leu Pro Val Asn  
 85 90 95

Gly Ala Asp Glu Thr Gly Gly Glu Leu Ala Gly Leu Ala Val Thr Asp  
 100 105 110

Glu Glu Met Ala Gln Lys Ala Val Asn Tyr Ile Phe Glu Thr Pro Gly  
 115 120 125

Gly Thr Ile Tyr His Gly Ala Asp Ser His Phe Ser Asn Tyr Phe Ala  
 130 135 140

Lys His Gly Lys Asp Phe Lys Ile Asp Val Ala Leu Asn Asn Tyr Gly  
 145 150 155 160

00760787 015601

[illegible]

Glu Ser Ala Ile Ala Ala Pro Leu Val Glu Glu Pro Leu Lys Leu Leu  
35 40 45

291

Ser Leu Val Phe Val Leu Ala Leu Ile Pro Val Arg Lys Leu Lys Ser  
50 55 60

Leu Phe Leu Leu Gly Ile Ala Ser Gly Leu Gly Phe Gln Met Ile Lys  
65 70 75 80

Asp Ile Gly Tyr Ile Arg Thr Asp Leu Pro Glu Gly Phe Asp Phe Thr  
85 90 95

Ile Ser Arg Ile Leu Glu Arg Ile Ile Ser Gly Ile Ala Ser His Trp  
100 105 110

Thr Phe Ser Gly Leu Ala Val Val Gly Val Tyr Leu Leu Tyr Arg Ala  
115 120 125

Tyr Lys Gly Gln Lys Val Gly Lys Lys Gln Gly Leu Ile Phe Leu Gly  
130 135 140

Leu Ala Leu Gly Thr His Phe Leu Phe Asn Ser Pro Phe Val Glu Leu  
145 150 155 160

Glu Thr Glu Leu Pro Leu Ala Ile Pro Val Val Thr Ala Ile Ala Leu  
165 170 175

Tyr Gly Phe Tyr His Ala Tyr Cys Phe Val Glu Lys His Asn Glu Leu  
180 185 190

Met Thr

<210> 137

<211> 129

<212> PRT

<213> Streptococcus pneumoniae

<400> 137

Met Lys Val Glu Pro Arg Cys Asp Val Leu Ser Arg Met Ser His Phe  
1 5 10 15

109210 1845960

292

Phe Ile Arg Ile Leu Ile Met Glu Leu Gln Glu Leu Val Glu Arg Ser  
20 25 30

Trp Ala Ile Arg Gln Ala Tyr His Glu Leu Glu Val Lys His His Asp  
35 40 45

Ser Lys Trp Thr Val Glu Glu Asp Leu Leu Ala Leu Ser Asn Asp Ile  
50 55 60

Gly Asn Phe Gln Arg Leu Val Met Thr Lys Gln Gly Arg Tyr Tyr Asp  
65 70 75 80

Glu Thr Pro Tyr Thr Leu Glu Gln Lys Leu Ser Glu Asn Ile Trp Trp  
85 90 95

Leu Leu Glu Leu Ser Gln Arg Leu Asp Ile Asp Ile Leu Thr Glu Met  
100 105 110

Glu Asn Phe Leu Ser Asp Lys Glu Lys Gln Leu Asn Val Arg Thr Trp  
115 120 125

Lys

<210> 138

<211> 324

<212> PRT

<213> Streptococcus pneumoniae

<400> 138

Met Leu Asp Trp Lys Gln Phe Phe Leu Ala Tyr Leu Arg Ser Arg Ser  
1 5 10 15

Arg Leu Phe Ile Tyr Leu Leu Ser Leu Ala Phe Leu Val Leu Leu Phe  
20 25 30

007697.013601

Gln Phe Leu Phe Ala Ser Leu Gly Ile Tyr Phe Leu Tyr Phe Phe Phe  
 35 40 45

Leu Cys Cys Phe Val Thr Ile Leu Phe Phe Thr Trp Asp Ile Leu Val  
 50 55 60

Glu Thr Gln Val Tyr Arg Gln Glu Leu Leu Tyr Gly Glu Arg Glu Ala  
 65 70 75 80

Lys Ser Pro Leu Glu Ile Ala Leu Ala Glu Lys Leu Glu Ala Arg Glu  
 85 90 95

Met Glu Leu Tyr Gln Gln Arg Ser Lys Ala Glu Arg Lys Leu Thr Asp  
 100 105 110

Leu Leu Asp Tyr Tyr Thr Leu Trp Val His Gln Ile Lys Thr Pro Ile  
 115 120 125

Ala Ala Ser Gln Leu Leu Val Ala Glu Val Val Asp Arg Gln Leu Lys  
 130 135 140

Gln Gln Leu Glu Gln Glu Ile Phe Lys Ile Asp Ser Tyr Thr Asn Leu  
 145 150 155 160

Val Leu Gln Tyr Leu Arg Leu Glu Ser Phe His Asp Asp Leu Val Leu  
 165 170 175

Lys Gln Val Gln Ile Glu Asp Leu Val Lys Glu Ile Ile Arg Lys Tyr  
 180 185 190

Ala Leu Phe Phe Ile Gln Lys Gly Leu Asn Val Asn Leu His Asp Leu  
 195 200 205

Asp Lys Glu Ile Val Thr Asp Lys Lys Trp Leu Leu Val Val Ile Glu  
 210 215 220

Gln Ile Ile Ser Asn Ser Leu Lys Tyr Thr Lys Glu Gly Gly Leu Glu  
 225 230 235 240

00769707 013504

Leu Val Leu Glu

Lys Asn Leu Ala Arg Thr Ser Gly Lys Pro Gly Lys Thr Gln Leu Leu  
50 55 60

295

Asn Phe Phe Asn Ile Asp Asp Lys Met Arg Phe Val Asp Val Pro Gly  
65 70 75 80

Tyr Gly Tyr Ala Arg Val Ser Lys Lys Glu Arg Glu Lys Trp Gly Cys  
85 90 95

Met Ile Glu Glu Tyr Leu Thr Thr Arg Glu Asn Leu Arg Ala Val Val  
100 105 110

Ser Leu Val Asp Leu Arg His Asp Pro Ser Ala Asp Asp Val Gln Met  
115 120 125

Tyr Glu Phe Leu Lys Tyr Tyr Glu Ile Pro Val Ile Ile Val Ala Thr  
130 135 140

Lys Ala Asp Lys Ile Pro Arg Gly Lys Trp Asn Lys His Glu Ser Ala  
145 150 155 160

Ile Lys Lys Lys Leu Asn Phe Asp Pro Ser Asp Asp Phe Ile Leu Phe  
165 170 175

Ser Ser Val Ser Lys Ala Gly Met Asp Glu Ala Trp Asp Ala Ile Leu  
180 185 190

Glu Lys Leu  
195

<210> 140

<211> 296

<212> PRT

<213> Streptococcus pneumoniae

<400> 140

Met Thr Lys Lys Gln Leu His Leu Val Ile Val Thr Gly Met Ser Gly  
1 5 10 15

00360787 04504

296

Ala Gly Lys Thr Val Ala Ile Gln Ser Phe Glu Asp Leu Gly Tyr Phe  
20 25 30

Thr Ile Asp Asn Met Pro Pro Ala Leu Leu Pro Lys Phe Leu Gln Leu  
35 40 45

Val Glu Ile Lys Glu Asp Asn Pro Lys Leu Ala Leu Val Val Asp Met  
50 55 60

Arg Ser Arg Ser Phe Phe Ser Glu Ile Gln Ala Val Leu Asp Glu Leu  
65 70 75 80

Glu Asn Gln Asp Gly Leu Asp Phe Lys Ile Leu Phe Leu Asp Ala Ala  
85 90 95

Asp Lys Glu Leu Val Ala Arg Tyr Lys Glu Thr Arg Arg Ser His Pro  
100 105 110

Leu Ala Ala Asp Gly Arg Ile Leu Asp Gly Ile Lys Leu Glu Arg Glu  
115 120 125

Leu Leu Ala Pro Leu Lys Asn Met Ser Gln Asn Val Val Asp Thr Thr  
130 135 140

Glu Leu Thr Pro Arg Glu Leu Arg Lys Thr Leu Ala Glu Gln Phe Ser  
145 150 155 160

Asp Gln Glu Gln Ala Gln Ser Phe Arg Ile Glu Val Met Ser Phe Gly  
165 170 175

Phe Lys Tyr Gly Ile Pro Ile Asp Ala Asp Leu Val Phe Asp Val Arg  
180 185 190

Phe Leu Pro Asn Pro Tyr Tyr Leu Pro Glu Leu Arg Asn Gln Thr Gly  
195 200 205

Val Asp Glu Pro Val Tyr Asp Tyr Val Met Asn His Pro Glu Ser Glu  
210 215 220

09760797 04504



297

Asp Phe Tyr Gln His Leu Leu Ala Leu Ile Glu Pro Ile Leu Pro Ser  
225 230 235 240

Tyr Gln Lys Glu Gly Lys Ser Val Leu Thr Ile Ala Met Gly Cys Thr  
245 250 255

Gly Gly Gln His Arg Ser Val Ala Phe Ala Lys Arg Leu Ala Gln Asp  
260 265 270

Leu Ser Lys Asn Trp Ser Val Asn Glu Gly His Arg Asp Lys Asp Arg  
275 280 285

Arg Lys Glu Thr Val Asn Arg Ser  
290 295

<210> 141

<211> 325

<212> PRT

<213> Streptococcus pneumoniae

<400> 141

Met Arg Lys Pro Lys Ile Thr Val Ile Gly Gly Gly Thr Gly Ser Pro  
1 5 10 15

Val Ile Leu Lys Ser Leu Arg Glu Lys Asp Val Glu Ile Ala Ala Ile  
20 25 30

Val Thr Val Ala Asp Asp Gly Gly Ser Ser Gly Glu Leu Arg Lys Asn  
35 40 45

Met Gln Gln Leu Thr Pro Pro Gly Asp Leu Arg Asn Val Leu Val Ala  
50 55 60

Met Ser Asp Met Pro Lys Phe Tyr Glu Lys Val Phe Gln Tyr Arg Phe  
65 70 75 80

009697 04504 2826260

298

Ser Glu Asp Ala Gly Ala Phe Ala Gly His Pro Leu Gly Asn Leu Ile  
85 90 95

Ile Ala Gly Leu Ser Glu Met Gln Gly Ser Thr Tyr Asn Ala Met Gln  
100 105 110

Leu Leu Ser Lys Phe Phe His Thr Thr Gly Lys Ile Tyr Pro Ser Ser  
115 120 125

Asp His Pro Leu Thr Leu His Ala Val Phe Gln Asp Gly Thr Glu Val  
130 135 140

Ala Gly Glu Ser His Ile Val Asp His Arg Gly Ile Ile Asp Asn Val  
145 150 155 160

Tyr Val Thr Asn Ala Leu Asn Asp Asp Thr Pro Leu Ala Ser Arg Arg  
165 170 175

Val Val Gln Thr Ile Leu Glu Ser Asp Met Ile Val Leu Gly Pro Gly  
180 185 190

Ser Leu Phe Thr Ser Ile Leu Pro Asn Ile Val Ile Lys Glu Ile Gly  
195 200 205

Arg Ala Leu Leu Glu Thr Lys Ala Glu Ile Ala Tyr Val Cys Asn Ile  
210 215 220

Met Thr Gln Arg Gly Glu Thr Glu His Phe Thr Asp Ser Asp His Val  
225 230 235 240

Glu Val Leu His Arg His Leu Gly Arg Pro Phe Ile Asp Thr Val Leu  
245 250 255

Val Asn Ile Glu Lys Val Pro Gln Glu Tyr Met Asn Ser Asn Arg Phe  
260 265 270

Asp Glu Tyr Leu Val Gln Val Glu His Asp Phe Val Gly Leu Cys Lys  
275 280 285

09769767 043634

299

Gln Val Ser Arg Val Ile Ser Ser Asn Phe Leu Arg Leu Glu Asn Gly  
290 295 300

Gly Ala Phe His Asp Gly Asp Leu Ile Val Asp Glu Leu Met Arg Ile  
305 310 315 320

Ile Gln Val Lys Lys  
325

<210> 142

<211> 392

<212> PRT

<213> Streptococcus pneumoniae

<400> 142

Met Lys Asn Leu Ile Lys Leu Leu Ile Ile Arg Leu Ile Val Asn Leu  
1 5 10 15

Ala Asp Ser Val Phe Tyr Ile Val Ala Leu Trp His Val Ser Asn Asn  
20 25 30

Tyr Ser Ser Ser Met Phe Leu Gly Ile Phe Ile Ala Val Asn Tyr Leu  
35 40 45

Pro Asp Leu Leu Leu Ile Phe Phe Gly Pro Val Ile Asp Arg Val Asn  
50 55 60

Pro Gln Lys Ile Leu Ile Ile Ser Ile Leu Val Gln Leu Ala Val Ala  
65 70 75 80

Val Ile Phe Leu Leu Leu Leu Asn Gln Ile Ser Phe Trp Val Ile Met  
85 90 95

Ser Leu Val Phe Ile Ser Val Met Ala Ser Ser Ile Ser Tyr Val Ile  
100 105 110

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[illegible]

Phe Phe Val Cys Phe Met Ser Lys Gly Val Phe Asn Ile Ile Phe Asn  
305 310 315 320

301

Ser Leu Tyr Gln Gln Ile Pro Pro His Gln Leu Leu Gly Arg Val Asn  
325 330 335

Thr Thr Ile Asp Ser Ile Ile Ser Phe Gly Met Pro Ile Gly Ser Leu  
340 345 350

Val Ala Gly Thr Leu Ile Asp Leu Asn Ile Glu Leu Val Leu Ile Ala  
355 360 365

Ile Ser Ile Pro Tyr Phe Leu Phe Ser Tyr Ile Phe Tyr Thr Asp Asn  
370 375 380

Gly Leu Lys Glu Phe Ser Ile Tyr  
385 390

<210> 143

<211> 225

<212> PRT

<213> Streptococcus pneumoniae

<400> 143

Met Met Ser Asn Lys Asn Lys Glu Ile Leu Ile Phe Ala Ile Leu Tyr  
1 5 10 15

Thr Val Leu Phe Met Phe Asp Gly Val Lys Leu Leu Ala Ser Leu Met  
20 25 30

Pro Ser Ala Ile Ala Asn Tyr Leu Val Tyr Val Val Leu Ala Leu Tyr  
35 40 45

Gly Ser Phe Leu Phe Lys Asp Arg Leu Ile Gln Gln Trp Lys Glu Ile  
50 55 60

Arg Lys Thr Lys Arg Lys Phe Phe Phe Gly Val Leu Thr Gly Trp Leu  
65 70 75 80

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302

Phe Leu Ile Leu Met Thr Val Val Phe Glu Phe Val Ser Glu Met Leu  
85 90 95

Lys Gln Phe Val Gly Leu Asp Gly Gln Gly Leu Asn Gln Ser Asn Ile  
100 105 110

Gln Ser Thr Phe Gln Glu Gln Pro Leu Leu Ile Ala Val Phe Ala Cys  
115 120 125

Val Ile Gly Pro Leu Val Glu Glu Leu Phe Phe Arg Gln Val Leu Leu  
130 135 140

His Tyr Leu Gln Glu Arg Leu Ser Gly Leu Leu Ser Ile Ile Leu Val  
145 150 155 160

Gly Leu Val Phe Ala Leu Thr His Met His Ser Leu Ala Leu Ser Glu  
165 170 175

Trp Ile Gly Ala Val Gly Tyr Leu Gly Gly Gly Leu Ala Phe Ser Ile  
180 185 190

Ile Tyr Val Lys Glu Lys Glu Asn Ile Tyr Tyr Pro Leu Leu Val His  
195 200 205

Met Leu Ser Asn Ser Leu Ser Leu Ile Ile Leu Ala Ile Ser Ile Val  
210 215 220

Lys  
225

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<211> 385

<212> PRT

<213> Streptococcus pneumoniae

<400> 144

Leu Lys Lys Pro Ile Ile Glu Phe Lys Asn Val Ser Lys Val Phe Glu  
1 5 10 15

Asp Ser Asn Thr Lys Val Leu Lys Asp Ile Asn Phe Glu Leu Glu Glu  
20 25 30

Gly Lys Phe Tyr Thr Leu Leu Gly Ala Ser Gly Ser Gly Lys Ser Thr  
35 40 45

Ile Leu Asn Ile Ile Ala Gly Leu Leu Asp Ala Thr Thr Gly Asp Ile  
50 55 60

Met Leu Asp Gly Val Arg Ile Asn Asp Ile Pro Thr Asn Lys Arg Asp  
65 70 75 80

Val His Thr Val Phe Gln Ser Tyr Ala Leu Phe Pro His Met Asn Val  
85 90 95

Phe Glu Asn Val Ala Phe Pro Leu Arg Leu Arg Lys Ile Asp Lys Lys  
100 105 110

Glu Ile Glu Gln Arg Val Ala Glu Val Leu Lys Met Val Gln Leu Glu  
115 120 125

Gly Tyr Glu Lys Arg Ser Ile Arg Lys Leu Ser Gly Gly Gln Arg Gln  
130 135 140

Arg Val Ala Ile Ala Arg Ala Ile Ile Asn Gln Pro Arg Val Val Leu  
145                    150                    155                    160

Leu Asp Glu Pro Leu Ser Ala Leu Asp Leu Lys Leu Arg Thr Asp Met  
165 170 175

304

Gln Tyr Glu Leu Arg Glu Leu Gln Gln Arg Leu Gly Ile Thr Phe Val  
180 185 190

Phe Val Thr His Asp Gln Glu Glu Ala Leu Ala Met Ser Asp Trp Ile  
195 200 205

Phe Val Met Asn Asp Gly Glu Ile Val Gln Ser Gly Thr Pro Val Asp  
210 215 220

Ile Tyr Asp Glu Pro Ile Asn His Phe Val Ala Thr Phe Ile Gly Glu  
225 230 235 240

Ser Asn Ile Leu Pro Gly Thr Met Ile Glu Asp Tyr Leu Val Glu Phe  
245 250 255

Asn Gly Lys Arg Phe Glu Ala Val Asp Gly Gly Met Lys Pro Asn Glu  
260 265 270

Pro Val Glu Val Val Ile Arg Pro Glu Asp Leu Arg Ile Thr Leu Pro  
275 280 285

Glu Glu Gly Lys Leu Gln Val Lys Val Asp Thr Gln Leu Phe Arg Gly  
290 295 300

Val His Tyr Glu Ile Ile Ala Tyr Asp Glu Leu Gly Asn Glu Trp Met  
305 310 315 320

Ile His Ser Thr Arg Lys Ala Ile Val Gly Glu Glu Ile Gly Leu Asp  
325 330 335

Phe Glu Pro Glu Asp Ile His Ile Met Arg Leu Asn Glu Thr Glu Glu  
340 345 350

Glu Phe Asp Ala Arg Ile Glu Glu Tyr Val Glu Ile Glu Glu Gln Glu  
355 360 365

Ala Gly Leu Ile Asn Ala Ile Glu Glu Glu Arg Asp Glu Glu Asn Lys  
370 375 380

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Leu

385

&lt;210&gt; 145

&lt;211&gt; 206

&lt;212&gt; PRT

&lt;213&gt; Streptococcus pneumoniae

&lt;400&gt; 145

Met Lys Ser Met Arg Ile Leu Phe Leu Leu Ala Leu Ile Gln Ile Ser

1

5

10

15

Leu Ser Ser Cys Phe Leu Trp Lys Glu Cys Ile Leu Ser Phe Lys Gln

20

25

30

Ser Thr Ala Phe Phe Ile Gly Ser Met Val Phe Val Ser Gly Ile Cys

35

40

45

Ala Gly Val Asn Tyr Leu Tyr Thr Arg Lys Gln Glu Val His Ser Val

50

55

60

Leu Ala Ser Lys Lys Ser Val Lys Leu Phe Tyr Ser Met Leu Leu Leu

65

70

75

80

Ile Asn Leu Leu Gly Ala Val Leu Val Leu Ser Asp Asn Leu Phe Ile

85

90

95

Lys Asn Thr Leu Gln Gln Glu Leu Val Asp Phe Leu Leu Pro Ser Phe

100

105

110

Phe Phe Leu Phe Gly Leu Asp Leu Leu Ile Phe Leu Pro Leu Lys Lys

115

120

125

Tyr Val Arg Asp Phe Leu Ala Met Leu Asp Arg Lys Lys Thr Val Leu

130

135

140

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	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2423	2424	2425	2426	2427	2428	2429	2430	2431	2432	2
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Ile Leu Met Thr Val Asn Pro Lys Thr Lys Lys Thr Thr Met Met Ser  
85 90 95

307

Leu Glu Arg Asp Ile Leu Thr Arg Ile Glu Ser Gly Asn Gly Gln Ala  
100 105 110

His Glu Ala Lys Leu Asn Ser Ala Tyr Ala Asp Gly Gly Ala Glu Leu  
115 120 125

Ala Ile Glu Thr Ile Gln Lys Met Met Asn Ile His Ile Asp Arg Tyr  
130 135 140

Val Met Val Asn Met Arg Gly Leu Gln Lys Leu Val Asp Ala Val Gly  
145 150 155 160

Gly Ile Thr Val Asn Asn Ile Leu Gly Phe Pro Ile Ser Ile Ser Asp  
165 170 175

Gln Glu Glu Phe Asn Thr Ile Ser Ile Gly Val Gly Glu Gln His Ile  
180 185 190

Gly Gly Glu Glu Ala Leu Val Tyr Ala Arg Met Arg Tyr Gln Asp Pro  
195 200 205

Glu Gly Asp Tyr Gly Arg Gln Lys Arg Gln Arg Glu Val Ile Gln Lys  
210 215 220

Val Met Glu Lys Ala Leu Ser Leu Asn Ser Ile Gly His Tyr Gln Glu  
225 230 235 240

Ile Leu Lys Ala Leu Ser Asp Asn Met Gln Thr Asn Ile Asp Leu Ser  
245 250 255

Ala Lys Ser Ile Pro Asn Leu Leu Gly Tyr Lys Asp Ser Phe Lys Thr  
260 265 270

Ile Glu Thr Gln Gln Leu Gln Gly Glu Gly Glu Ile Leu Gln Gly Val  
275 280 285

Ser Tyr Gln Ile Val Ser Arg Ala His Met Leu Glu Met Gln Asn Leu  
290 295 300

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Ala Val Leu Phe Glu Asp Leu Phe Gly Arg Ala Pro Val Gly Asp Glu  
325 330 335

Asp Asn

<211> 331

<213> Streptococcus pneumoniae

<400> 147

Val Phe Phe Phe Ser His Ser Leu Leu Glu Ile Leu Asp Phe Asp Trp  
20 25 30

Leu Leu Val Phe Ser Met Ser Met Thr Cys Leu Leu Ala Leu Phe Trp  
50 55 60

Arg Leu Leu Ala Gly Gln Glu Val Val Gln Val Ala Asp Pro Asp Leu  
85 90 95

Asp Ala Ser Phe Lys Ser Leu Ser Gly Lys Leu Asn Leu Leu Thr Glu  
100 105 110

309

Ala Leu Gln Lys Ala Glu Asn Gln Ser Leu Ala Gln Glu Glu Glu Ile  
115 120 125

Ile Glu Lys Glu Arg Lys Arg Ile Ala Arg Asp Leu His Asp Thr Val  
130 135 140

Ser Gln Glu Leu Phe Ala Ala His Met Ile Leu Ser Gly Ile Ser Gln  
145 150 155 160

Gln Ala Leu Lys Leu Asp Arg Glu Lys Met Gln Thr Gln Leu Gln Ser  
165 170 175

Val Thr Ala Ile Leu Glu Thr Ala Gln Lys Asp Leu Arg Val Leu Leu  
180 185 190

Leu His Leu Arg Pro Val Glu Leu Glu Gln Lys Ser Leu Ile Glu Gly  
195 200 205

Ile Gln Ile Leu Leu Lys Glu Leu Glu Asp Lys Ser Asp Leu Arg Val  
210 215 220

Ser Leu Lys Gln Asn Met Thr Lys Leu Pro Lys Lys Ile Glu Glu His  
225 230 235 240

Ile Phe Arg Ile Leu Gln Glu Leu Ile Ser Asn Thr Leu Arg His Ala  
245 250 255

Gln Ala Ser Cys Leu Asp Val Tyr Leu Tyr Gln Thr Asp Val Glu Leu  
260 265 270

Gln Leu Lys Val Val Asp Asn Gly Ile Gly Phe Gln Leu Gly Ser Leu  
275 280 285

Asp Asp Leu Ser Tyr Gly Leu Arg Asn Ile Lys Glu Arg Val Glu Asp  
290 295 300

Met Ala Gly Thr Val Gln Leu Leu Thr Ala Pro Lys Gln Gly Leu Ala  
305 310 315 320

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310

Val Asp Ile Arg Ile Pro Leu Leu Asp Lys Glu

325

330

<210> 148

<211> 288

<212> PRT

<213> Streptococcus pneumoniae

<400> 148

Met Ile Val Ser Ile Ile Ser Gln Gly Phe Val Trp Ala Ile Leu Gly

1

5

10

15

Leu Gly Ile Phe Met Thr Phe Arg Ile Leu Asn Phe Pro Asp Met Thr

20

25

30

Thr Glu Gly Ser Phe Pro Leu Gly Gly Ala Val Ala Val Thr Leu Ile

35

40

45

Thr Lys Gly Val Asn Pro Phe Leu Ala Thr Leu Val Ala Val Gly Ala

50

55

60

Gly Cys Leu Ala Gly Met Ala Ala Gly Leu Leu Tyr Thr Lys Gly Lys

65

70

75

80

Ile Pro Thr Leu Leu Ser Gly Ile Leu Val Met Thr Ser Cys His Ser

85

90

95

Ile Met Leu Leu Ile Met Gly Arg Ala Asn Leu Gly Leu Leu Gly Thr

100

105

110

Lys Gln Ile Gln Asp Val Leu Pro Phe Asp Ser Asp Leu Asn Gln Leu

115

120

125

Leu Thr Gly Leu Ile Phe Val Ser Ile Val Ile Ala Leu Met Leu Phe

130

135

140

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Figure 1 consists of 12 sub-graphs, labeled (a) through (l), each showing the rate of polymerization ( $R_p$ ) in mole/l·hr on the y-axis against a different parameter on the x-axis. The parameters are: (a) [MMA], (b) [BPO], (c) [C<sub>6</sub>H<sub>6</sub>], (d) [C<sub>6</sub>H<sub>5</sub>NO<sub>2</sub>], (e) [C<sub>6</sub>H<sub>5</sub>I], (f) [C<sub>6</sub>H<sub>5</sub>Br], (g) [C<sub>6</sub>H<sub>5</sub>Cl], (h) [C<sub>6</sub>H<sub>5</sub>F], (i) [C<sub>6</sub>H<sub>5</sub>OH], (j) [C<sub>6</sub>H<sub>5</sub>NH<sub>2</sub>], (k) [C<sub>6</sub>H<sub>5</sub>SH], and (l) [C<sub>6</sub>H<sub>5</sub>COOH]. The graphs show that  $R_p$  generally increases with increasing [MMA] and [BPO], and decreases with increasing concentrations of the various inhibitors. The effect of [C<sub>6</sub>H<sub>6</sub>] is also shown, with  $R_p$  increasing as [C<sub>6</sub>H<sub>6</sub>] increases.

Met Lys Lys Met Lys Val Trp Ser Thr Val Leu Ala Thr Gly Val Ala  
1 5 10 15

312

Leu Thr Thr Leu Ala Ala Cys Ser Gly Gly Ser Asn Ser Thr Thr Ala  
20 25 30

Ser Ser Ser Glu Glu Lys Ala Asp Lys Ser Gln Glu Leu Val Ile Tyr  
35 40 45

Ser Asn Ser Val Ser Asn Gly Arg Gly Asp Trp Leu Thr Ala Lys Ala  
50 55 60

Lys Glu Ala Gly Phe Asn Ile Lys Met Val Asp Ile Ala Gly Ala Gln  
65 70 75 80

Leu Ala Asp Arg Val Ile Ala Glu Lys Asn Asn Ala Val Ala Asp Met  
85 90 95

Val Phe Gly Ile Gly Ala Val Asp Ser Asn Lys Ile Arg Asp Gln Lys  
100 105 110

Leu Leu Val Gln Tyr Lys Pro Lys Trp Leu Asp Lys Ile Asp Gln Ser  
115 120 125

Leu Ser Asp Lys Asp Asn Tyr Tyr Asn Pro Val Ile Val Gln Pro Leu  
130 135 140

Val Leu Ile Gly Ala Pro Asp Val Lys Glu Met Pro Lys Asp Trp Thr  
145 150 155 160

Glu Leu Gly Ser Lys Tyr Lys Gly Lys Tyr Ser Ile Ser Gly Leu Gln  
165 170 175

Gly Gly Thr Gly Arg Ala Ile Leu Ala Ser Ile Leu Val Arg Tyr Leu  
180 185 190

Asp Asp Lys Gly Glu Leu Gly Val Ser Glu Lys Gly Trp Glu Val Ala  
195 200 205

Lys Glu Tyr Leu Lys Asn Ala Tyr Thr Leu Gln Lys Gly Glu Ser Ser  
210 215 220

007693 013604



313

Ile Val Lys Met Leu Asp Lys Glu Asp Pro Ile Gln Tyr Gly Met Met  
225 230 235 240

Trp Gly Ser Gly Ala Leu Val Gly Gln Lys Glu Gln Asn Val Val Phe  
245 250 255

Lys Val Met Thr Pro Glu Ile Gly Val Pro Phe Val Thr Glu Gln Thr  
260 265 270

Met Val Leu Ser Thr Ser Lys Lys Gln Ala Leu Ala Lys Glu Phe Ile  
275 280 285

Asp Trp Phe Gly Gln Ser Glu Ile Gln Val Glu Tyr Ser Lys Asn Phe  
290 295 300

Gly Ser Ile Pro Ala Asn Lys Asp Ala Leu Lys Asp Leu Pro Glu Asp  
305 310 315 320

Thr Lys Lys Phe Val Asp Gln Val Lys Pro Gln Asn Ile Asp Trp Glu  
325 330 335

Ala Val Gly Lys His Leu Asp Glu Trp Val Glu Lys Ala Glu Leu Glu  
340 345 350

Tyr Val Gln  
355

<210> 150

<211> 336

<212> PRT

<213> Streptococcus pneumoniae

<400> 150

Met Ile Lys Phe Asp Asn Ile Gln Ile Lys Tyr Gly Asp Phe Val Ala  
1 5 10 15

314

Ile Asp Asn Leu Asn Leu Asp Ile His Glu Gly Glu Phe Phe Thr Phe  
20 25 30

Leu Gly Pro Ser Gly Cys Gly Lys Ser Thr Thr Leu Arg Ala Leu Val  
35 40 45

Gly Phe Leu Asp Pro Ser Ser Gly Ser Ile Glu Val Asn Gly Thr Asp  
50 55 60

Val Thr His Leu Glu Pro Glu Lys Arg Gly Ile Gly Ile Val Phe Gln  
65 70 75 80

Ser Tyr Ala Leu Phe Pro Thr Met Thr Val Phe Asp Asn Ile Ala Phe  
85 90 95

Gly Leu Lys Val Lys Lys Val Ala Pro Asp Val Ile Lys Ala Lys Val  
100 105 110

Ser Ala Val Ala Ala Lys Ile Lys Ile Ser Asp Gln Gln Leu Gln Arg  
115 120 125

Asn Val Ser Glu Leu Ser Gly Gly Gln Gln Gln Arg Val Ala Leu Ala  
130 135 140

Arg Ala Leu Val Leu Glu Pro Lys Ile Leu Cys Leu Asp Glu Pro Leu  
145 150 155 160

Ser Asn Leu Asp Ala Lys Leu Arg Val Asp Leu Arg Lys Glu Leu Lys  
165 170 175

Arg Leu Gln Lys Glu Leu Gly Ile Thr Thr Leu Tyr Val Thr His Asp  
180 185 190

Gln Glu Glu Ala Leu Thr Leu Ser Asp Arg Ile Ala Val Phe Asn Asn  
195 200 205

Gly Tyr Ile Glu Gln Val Gly Thr Pro Val Glu Ile Tyr His Asn Ser  
210 215 220

00769797 04504

315

Gln Thr Glu Phe Val Cys Asp Phe Ile Gly Asp Ile Asn Val Leu Thr  
225 230 235 240

Asp Glu Thr Val His Glu Val Leu Leu Lys Asn Thr Ser Val Phe Leu  
245 250 255

Glu Asp Lys Lys Gly Tyr Ile Arg Leu Glu Lys Val Arg Phe Asn Arg  
260 265 270

Glu Thr Glu Gln Asp Phe Ile Leu Lys Gly Thr Ile Ile Asp Val Glu  
275 280 285

Phe Ser Gly Val Thr Ile His Tyr Thr Ile Lys Val Ser Glu Ser Gln  
290 295 300

Ile Leu Asn Val Thr Ser Ile Asp Ser Gln Ala Ala Ile Arg Ser Val  
305 310 315 320

Gly Glu Ser Val Glu Leu Phe Ile Thr Pro Ser Asp Val Leu Gln Phe  
325 330 335

<210> 151

<211> 563

<212> PRT

<213> Streptococcus pneumoniae

<400> 151

Met Arg His Lys Leu Asn Leu Lys Asp Trp Leu Ile Arg Leu Gly Leu  
1 5 10 15

Ile Trp Phe Leu Val Thr Phe Ile Ile Tyr Pro Asn Phe Asp Leu Val  
20 25 30

0069387 015904

Lys Glu Phe Gln Thr Ile Asn Pro Met Ile Ile Thr Phe Ala Gly Met  
225                      230                      235                      240

317

Gly Asn Ser Arg Asp Leu Ala Ala Leu Leu Ala Ile Ile Leu Gly Ile  
245 250 255

Ala Thr Thr Ile Leu Leu Thr Ile Met Asn Lys Ile Glu Lys Gly Gly  
260 265 270

Asn Tyr Ile Ser Ile Ser Lys Thr Lys Ala Pro Leu Lys Lys Gln Lys  
275 280 285

Ile Ala Ser Lys Pro Trp Asn Ile Ile Ala His Ile Val Ala Tyr Gly  
290 295 300

Leu Phe Thr Val Phe Met Leu Pro Leu Ile Phe Ile Val Leu Tyr Ser  
305 310 315 320

Phe Thr Asp Pro Val Ala Ile Gln Thr Gly Asn Leu Thr Leu Ser Asn  
325 330 335

Phe Thr Leu Glu Asn Tyr Arg Leu Phe Phe Ser Asn Ser Ala Ala Phe  
340 345 350

Ser Pro Phe Leu Val Ser Phe Ile Tyr Ser Ile Ile Ala Ala Thr Thr  
355 360 365

Ala Thr Ile Leu Ala Val Val Phe Ala Arg Val Val Arg Lys His Lys  
370 375 380

Ser Arg Phe Asp Phe Leu Phe Glu Tyr Gly Ala Leu Leu Pro Trp Leu  
385 390 395 400

Leu Pro Ser Thr Leu Leu Ala Val Ser Leu Leu Phe Thr Phe Asn Gln  
405 410 415

Pro Gln Phe Leu Val Leu Asn Gln Ile Leu Val Gly Ser Leu Val Ile  
420 425 430

Leu Leu Ile Ala Tyr Ile Val Val Lys Ile Pro Phe Ser Tyr Arg Met  
435 440 445

009210 28269260

[illegible]

Val Arg Lys

<210> 152

<211> 443

<212> PRT

<213> Streptococcus pneumoniae

<400> 152

Met Ile Lys Asn Pro Lys Leu Leu Thr Lys Ser Phe Leu Arg Ser Phe  
1 5 10 15

Ala Ile Leu Gly Gly Val Gly Leu Val Ile His Ile Ala Ile Tyr Leu  
20 25 30

Gln Ile Val Lys Leu Gln Asn Gln Lys Val Ser Phe Val Arg Gly Ala  
225                    230                    235                    240

320

Ser His Glu Leu Lys Thr Pro Leu Ala Ser Leu Arg Ile Ile Leu Glu  
245 250 255

Asn Met Gln His Asn Ile Gly Asp Tyr Lys Asp His Pro Lys Tyr Ile  
260 265 270

Ala Lys Ser Ile Asn Lys Ile Asp Gln Met Ser His Leu Leu Glu Glu  
275 280 285

Val Leu Glu Ser Ser Lys Phe Gln Glu Trp Thr Glu Cys Arg Glu Thr  
290 295 300

Leu Thr Val Lys Pro Val Leu Val Asp Ile Leu Ser Arg Tyr Gln Glu  
305 310 315 320

Leu Ala His Ser Ile Gly Val Thr Ile Glu Asn Gln Leu Thr Asp Ala  
325 330 335

Thr Arg Val Val Met Ser Leu Arg Ala Leu Asp Lys Val Leu Thr Asn  
340 345 350

Leu Ile Ser Asn Ala Ile Lys Tyr Ser Asp Lys Asn Gly Arg Val Ile  
355 360 365

Ile Ser Glu Gln Asp Gly Tyr Leu Ser Ile Lys Asn Thr Cys Ala Pro  
370 375 380

Leu Ser Asp Gln Glu Leu Glu His Leu Phe Asp Ile Phe Tyr His Ser  
385 390 395 400

Gln Ile Val Thr Asp Lys Asp Glu Ser Ser Gly Leu Gly Leu Tyr Ile  
405 410 415

Val Asn Asn Ile Leu Glu Ser Tyr Gln Met Asp Tyr Ser Phe Leu Pro  
420 425 430

Tyr Glu His Gly Met Glu Phe Lys Ile Ser Leu  
435 440

09769737 09501



&lt;210&gt; 153

&lt;211&gt; 290

&lt;212&gt; PRT

&lt;213&gt; Streptococcus pneumoniae

&lt;400&gt; 153

Met Asp Lys Ile Ile Lys Thr Ile Ser Glu Ser Gly Ala Phe Arg Ala

1 5 10 15

Phe Val Leu Asp Ser Thr Glu Thr Val Arg Thr Ala Gln Glu Lys His

20 25 30

Gln Thr Gln Ala Ser Ser Thr Val Ala Leu Gly Arg Thr Leu Ile Ala

35 40 45

Ser Gln Ile Leu Ala Ala Asn Glu Lys Gly Asn Thr Lys Leu Thr Val

50 55 60

Lys Val Leu Gly Ser Ser Ser Leu Gly Ala Ile Ile Thr Val Ala Asp

65 70 75 80

Thr Lys Gly Asn Val Lys Gly Tyr Val Gln Asn Pro Gly Val Asp Ile

85 90 95

Lys Lys Thr Ala Thr Gly Glu Val Leu Val Gly Pro Phe Val Gly Asn

100 105 110

Gly Gln Phe Leu Val Ile Thr Asp Tyr Gly Thr Gly Asn Pro Tyr Asn

115 120 125

Ser Ile Thr Pro Leu Ile Ser Gly Glu Ile Gly Glu Asp Leu Ala Phe

130 135 140

Tyr Leu Thr Glu Ser Gln Gln Thr Pro Ser Ala Val Gly Leu Asn Val

145 150 155 160

00959787.019604

322

Leu Leu Asp Glu Glu Asp Lys Val Lys Val Ala Gly Gly Phe Leu Val  
165 170 175

Gln Val Leu Pro Gly Ala Lys Lys Glu Glu Ile Ala Arg Phe Glu Lys  
180 185 190

Arg Ile Gln Glu Met Pro Ala Ile Ser Thr Leu Leu Glu Ser Asp Asp  
195 200 205

His Ile Glu Ala Leu Leu Lys Ala Ile Tyr Gly Asp Glu Ala Tyr Lys  
210 215 220

Arg Leu Ser Glu Glu Glu Ile Arg Phe Gln Cys Asp Cys Ser His Glu  
225 230 235 240

Arg Phe Met Asn Ala Leu Ala Ser Leu Pro Ser Ser Asp Leu Gln Glu  
245 250 255

Met Lys Glu Glu Asp His Gly Ala Glu Ile Thr Cys Gln Phe Cys Gln  
260 265 270

Thr Thr Tyr Asn Phe Asp Glu Lys Asp Leu Glu Glu Leu Ile Arg Asp  
275 280 285

Lys Ser  
290

<210> 154

<211> 152

<212> PRT

<213> Streptococcus pneumoniae

<400> 154

Met Lys Ser Ile Thr Lys Lys Ile Lys Ala Thr Leu Ala Gly Val Ala  
1 5 10 15

323

Ala Leu Phe Ala Val Phe Ala Pro Ser Phe Val Ser Ala Gln Glu Ser  
20 25 30

Ser Thr Tyr Thr Val Lys Glu Gly Asp Thr Leu Ser Glu Ile Ala Glu  
35 40 45

Thr His Asn Thr Thr Val Glu Lys Leu Ala Glu Asn Asn His Ile Asp  
50 55 60

Asn Ile His Leu Ile Tyr Val Asp Gln Glu Leu Val Ile Asp Gly Pro  
65 70 75 80

Val Ala Pro Val Ala Thr Pro Ala Pro Ala Thr Tyr Ala Ala Pro Ala  
85 90 95

Ala Gln Asp Glu Thr Val Ser Ala Pro Val Ala Glu Thr Pro Val Val  
100 105 110

Ser Glu Thr Val Val Ser Thr Val Ser Gly Ser Glu Ala Glu Ala Lys  
115 120 125

Glu Trp Ile Ala Gln Lys Glu Ser Gly Gly Ser Ile Gln Leu Gln Met  
130 135 140

Asp Val Ile Ser Asp Val Thr Asn  
145 150

<210> 155

<211> 677

<212> PRT

<213> Streptococcus pneumoniae

<400> 155

Met Asn Leu Gly Glu Phe Trp Tyr Asn Lys Ile Asn Lys Asn Arg Gly  
1 5 10 15

Arg Arg Leu Met Lys Lys Val Arg Phe Ile Phe Leu Ala Leu Leu Phe  
 20 25 30

Phe Leu Ala Ser Pro Glu Gly Ala Met Ala Ser Asp Gly Thr Trp Gln  
 35 40 45

Gly Lys Gln Tyr Leu Lys Glu Asp Gly Ser Gln Ala Ala Asn Glu Trp  
 50 55 60

Val Phe Asp Thr His Tyr Gln Ser Trp Phe Tyr Ile Lys Ala Asp Ala  
 65 70 75 80

Asn Tyr Ala Glu Asn Glu Trp Leu Lys Gln Gly Asp Asp Tyr Phe Tyr  
 85 90 95

Leu Lys Ser Gly Gly Tyr Met Ala Lys Ser Glu Trp Val Glu Asp Lys  
 100 105 110

Gly Ala Phe Tyr Tyr Leu Asp Gln Asp Gly Lys Met Lys Arg Asn Ala  
 115 120 125

Trp Val Gly Thr Ser Tyr Val Gly Ala Thr Gly Ala Lys Val Ile Glu  
 130 135 140

Asp Trp Val Tyr Asp Ser Gln Tyr Asp Ala Trp Phe Tyr Ile Lys Ala  
 145 150 155 160

Asp Gly Gln His Ala Glu Lys Glu Trp Leu Gln Ile Lys Gly Lys Asp  
 165 170 175

Tyr Tyr Phe Lys Ser Gly Gly Tyr Leu Leu Thr Ser Gln Trp Ile Asn  
 180 185 190

Gln Ala Tyr Val Asn Ala Ser Gly Ala Lys Val Gln Gln Gly Trp Leu  
 195 200 205

Phe Asp Lys Gln Tyr Gln Ser Trp Phe Tyr Ile Lys Glu Asn Gly Asn  
 210 215 220

005670 0450

325

Tyr Ala Asp Lys Glu Trp Ile Phe Glu Asn Gly His Tyr Tyr Tyr Leu  
225 230 235 240

Lys Ser Gly Gly Tyr Met Ala Ala Asn Glu Trp Ile Trp Asp Lys Glu  
245 250 255

Ser Trp Phe Tyr Leu Lys Phe Asp Gly Lys Met Ala Glu Lys Glu Trp  
260 265 270

Val Tyr Asp Ser His Ser Gln Ala Trp Tyr Tyr Phe Lys Ser Gly Gly  
275 280 285

Tyr Met Thr Ala Asn Glu Trp Ile Trp Asp Lys Glu Ser Trp Phe Tyr  
290 295 300

Leu Lys Ser Asp Gly Lys Ile Ala Glu Lys Glu Trp Val Tyr Asp Ser  
305 310 315 320

His Ser Gln Ala Trp Tyr Tyr Phe Lys Ser Gly Gly Tyr Met Thr Ala  
325 330 335

Asn Glu Trp Ile Trp Asp Lys Glu Ser Trp Phe Tyr Leu Lys Ser Asp  
340 345 350

Gly Lys Ile Ala Glu Lys Glu Trp Val Tyr Asp Ser His Ser Gln Ala  
355 360 365

Trp Tyr Tyr Phe Lys Ser Gly Gly Tyr Met Ala Lys Asn Glu Thr Val  
370 375 380

Asp Gly Tyr Gln Leu Gly Ser Asp Gly Lys Trp Leu Gly Gly Lys Thr  
385 390 395 400

Thr Asn Glu Asn Ala Ala Tyr Tyr Gln Val Val Pro Val Thr Ala Asn  
405 410 415

Val Tyr Asp Ser Asp Gly Glu Lys Leu Ser Tyr Ile Ser Gln Gly Ser  
420 425 430

00750787 01501

Ala Thr Lys Trp Ile Lys Glu Asn Tyr Ile Asp Arg Gly Arg Thr Phe  
625                      630                      635                      640

327

Leu Gly Asn Lys Ala Ser Gly Met Asn Val Glu Tyr Ala Ser Asp Pro  
645 650 655

Tyr Trp Gly Glu Lys Ile Ala Ser Val Met Met Lys Ile Asn Glu Lys  
660 665 670

Leu Gly Gly Lys Asp  
675

<210> 156

<211> 309

<212> PRT

<213> Streptococcus pneumoniae

<400> 156

Met Lys Lys Leu Gly Thr Leu Leu Val Leu Phe Leu Ser Ala Ile Ile  
1 5 10 15

Leu Val Ala Cys Ala Ser Gly Lys Lys Asp Thr Thr Ser Gly Gln Lys  
20 25 30

Leu Lys Val Val Ala Thr Asn Ser Ile Ile Ala Asp Ile Thr Lys Asn  
35 40 45

Ile Ala Gly Asp Lys Ile Asp Leu His Ser Ile Val Pro Ile Gly Gln  
50 55 60

Asp Pro His Glu Tyr Glu Pro Leu Pro Glu Asp Val Lys Lys Thr Ser  
65 70 75 80

Glu Ala Asn Leu Ile Phe Tyr Asn Gly Ile Asn Leu Glu Thr Gly Gly  
85 90 95

Asn Ala Trp Phe Thr Lys Leu Val Glu Asn Ala Lys Lys Thr Glu Asn  
100 105 110

0036937 01360  
109210 1569200

Glu Gly Leu Ala Lys  
305



&lt;210&gt; 157

&lt;211&gt; 419

&lt;212&gt; PRT

&lt;213&gt; Streptococcus pneumoniae

&lt;400&gt; 157

Met Glu Trp Tyr Lys Lys Ile Gly Leu Leu Ala Thr Thr Gly Leu Ala  
 1 5 10 15

Leu Phe Gly Leu Gly Ala Cys Ser Asn Tyr Gly Lys Ser Ala Asp Gly  
 20 25 30

Thr Val Thr Ile Glu Tyr Phe Asn Gln Lys Lys Glu Met Thr Lys Thr  
 35 40 45

Leu Glu Glu Ile Thr Arg Asp Phe Glu Lys Glu Asn Pro Lys Ile Lys  
 50 55 60

Val Lys Val Val Asn Val Pro Asn Ala Gly Glu Val Leu Lys Thr Arg  
 65 70 75 80

Val Leu Ala Gly Asp Val Pro Asp Val Val Asn Ile Tyr Pro Gln Ser  
 85 90 95

Ile Glu Leu Gln Glu Trp Ala Lys Ala Gly Val Phe Glu Asp Leu Ser  
 100 105 110

Asn Lys Asp Tyr Leu Lys Arg Val Lys Asn Gly Tyr Ala Glu Lys Tyr  
 115 120 125

Ala Val Asn Glu Lys Val Tyr Asn Val Pro Phe Thr Ala Asn Ala Tyr  
 130 135 140

Gly Ile Tyr Tyr Asn Lys Asp Lys Phe Glu Glu Leu Gly Leu Lys Val  
 145 150 155 160

0056967 01304  
 109270 109260

330

Pro Glu Thr Trp Asp Glu Phe Glu Gln Leu Val Lys Asp Ile Val Ala  
165 170 175

Lys Gly Gln Thr Pro Phe Gly Ile Ala Gly Ala Asp Ala Trp Thr Leu  
180 185 190

Asn Gly Tyr Asn Gln Leu Ala Phe Ala Thr Ala Thr Gly Gly Gly Lys  
195 200 205

Glu Ala Asn Gln Tyr Leu Arg Tyr Ser Gln Pro Asn Ala Ile Lys Leu  
210 215 220

Ser Asp Pro Ile Met Lys Asp Asp Ile Lys Val Met Asp Ile Leu Arg  
225 230 235 240

Ile Asn Gly Ser Lys Gln Lys Asn Trp Glu Gly Ala Gly Tyr Thr Asp  
245 250 255

Val Ile Gly Ala Phe Ala Arg Gly Asp Val Leu Met Thr Pro Asn Gly  
260 265 270

Ser Trp Ala Ile Thr Ala Ile Asn Glu Gln Lys Pro Asn Phe Lys Ile  
275 280 285

Gly Thr Phe Met Ile Pro Gly Lys Glu Lys Gly Gln Ser Leu Thr Val  
290 295 300

Gly Ala Gly Asp Leu Ala Trp Ser Ile Ser Ala Thr Thr Lys His Pro  
305 310 315 320

Lys Glu Ala Asn Ala Phe Val Glu Tyr Met Thr Arg Pro Glu Val Met  
325 330 335

Gln Lys Tyr Tyr Asp Val Asp Gly Ser Pro Thr Ala Ile Glu Gly Val  
340 345 350

Lys Gln Ala Gly Glu Asp Ser Pro Leu Ala Gly Met Thr Glu Tyr Ala  
355 360 365

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331

Phe Thr Asp Arg His Leu Val Trp Leu Gln Gln Tyr Trp Thr Ser Glu  
370 375 380

Ala Asp Phe His Thr Leu Thr Met Asn Tyr Val Leu Thr Gly Asp Lys  
385 390 395 400

Gln Gly Met Val Asn Asp Leu Asn Ala Phe Phe Asn Pro Met Lys Ala  
405 410 415

Asp Val Asp

<210> 158

<211> 559

<212> PRT

<213> Streptococcus pneumoniae

<400> 158

Met Lys Lys Ile Lys Pro His Gly Pro Leu Pro Ser Gln Thr Gln Leu  
1 5 10 15

Ala Tyr Leu Gly Asp Glu Leu Ala Ala Phe Ile His Phe Gly Pro Asn  
20 25 30

Thr Phe Tyr Asp Gln Glu Trp Gly Thr Gly Gln Glu Asp Pro Glu Arg  
35 40 45

Phe Asn Pro Ser Gln Leu Asp Ala Arg Glu Trp Val Arg Val Leu Lys  
50 55 60

Glu Thr Gly Phe Lys Lys Leu Ile Leu Val Val Lys His His Asp Gly  
65 70 75 80

Phe Val Leu Tyr Pro Thr Ala His Thr Asp Tyr Ser Val Lys Val Ser  
85 90 95

09269787 043604

Gly Thr Pro Leu Leu Leu Asn Ile Pro Pro Asn Gln Ala Gly Leu Phe  
290 295 300

[illegible]

Gln Pro Gly Thr Gly Val His Gly Val Ala Tyr Gln Asp Glu Ile Gln  
500 505 510

Val Leu Ala Phe Gln Thr Gly Glu Thr Glu Lys Ser Leu Thr Leu Pro  
 515 520 525

Thr Leu Tyr Phe Ala Gly Asp Lys Thr Leu Asp Phe Tyr Leu Asn Leu  
 530 535 540

Thr Val Asp Gly Gln Leu Val Asp Gln Leu Gln Val Gln Val Ser  
 545 550 555

<210> 159

<211> 227

<212> PRT

<213> Streptococcus pneumoniae

<400> 159

Met Leu Glu Arg Leu Lys Arg Ile His Tyr Met Phe Trp Ile Ser Leu  
 1 5 10 15

Ile Phe Met Ile Phe Pro Ile Leu Ser Val Val Thr Gly Trp Leu Ser  
 20 25 30

Ala Trp His Leu Leu Ile Asp Ile Leu Phe Val Val Ala Tyr Leu Gly  
 35 40 45

Val Leu Thr Thr Lys Ser Gln Arg Leu Ser Trp Leu Tyr Trp Gly Leu  
 50 55 60

Met Leu Thr Tyr Val Val Gly Asn Thr Ala Phe Val Ala Val Asn Tyr  
 65 70 75 80

Ile Trp Phe Phe Phe Phe Leu Ser Asn Leu Leu Ser Tyr His Phe Ser  
 85 90 95

Val Arg Ser Leu Lys Ser Leu His Val Trp Thr Phe Leu Leu Ala Gln  
 100 105 110

09750797.043504

335

Val Leu Val Val Gly Gln Leu Leu Ile Phe Gln Arg Ile Glu Val Glu  
115 120 125

Phe Leu Phe Tyr Leu Leu Val Ile Leu Thr Phe Val Asp Leu Met Thr  
130 135 140

Phe Gly Leu Val Arg Ile Arg Ile Val Glu Asp Leu Lys Glu Ala Gln  
145 150 155 160

Val Lys Gln Asn Ala Gln Ile Asn Leu Leu Leu Ala Glu Asn Glu Arg  
165 170 175

Ser Arg Ile Gly Gln Asp Leu His Asp Ser Leu Gly His Thr Phe Ala  
180 185 190

Met Leu Ser Val Lys Thr Asp Leu Ala Leu Gln Leu Phe Gln Met Glu  
195 200 205

Ala Tyr Pro Gln Val Glu Lys Glu Leu Lys Glu Ile His Gln Ile Ser  
210 215 220

Lys Asp Pro  
225

<210> 160

<211> 370

<212> PRT

<213> Streptococcus pneumoniae

<400> 160

Met Asn Asp Lys Leu Lys Ile Phe Leu Leu Leu Gly Val Phe Phe Leu  
1 5 10 15

Ala Ile Thr Gly Phe Tyr Val Leu Leu Ile Arg Asn Ala Gly Gln Thr  
20 25 30

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Asp Ala Ser Gln Ile Glu Lys Ala Ala Val Ser Gln Gly Gly Lys Ala  
35 40 45

Val Lys Lys Thr Glu Ile Ser Lys Asp Ala Asp Leu His Glu Ile Tyr  
50 55 60

Leu Ala Gly Gly Cys Phe Trp Gly Val Glu Glu Tyr Phe Ser Arg Val  
65 70 75 80

Pro Gly Val Thr Asp Ala Val Ser Gly Tyr Ala Asn Gly Arg Gly Glu  
85 90 95

Thr Thr Lys Tyr Glu Leu Ile Asn Gln Thr Gly His Ala Glu Thr Val  
100 105 110

His Val Thr Tyr Asp Ala Lys Gln Ile Ser Leu Lys Glu Ile Leu Leu  
115 120 125

His Tyr Phe Arg Ile Ile Asn Pro Thr Ser Lys Asn Lys Gln Gly Asn  
130 135 140

Asp Val Gly Thr Gln Tyr Arg Thr Gly Val Tyr Tyr Thr Asp Asp Lys  
145 150 155 160

Asp Leu Glu Val Ile Asn Gln Val Phe Asp Glu Val Ala Lys Lys Tyr  
165 170 175

Asp Gln Pro Leu Ala Val Glu Lys Glu Asn Leu Lys Asn Phe Val Val  
180 185 190

Ala Glu Asp Tyr His Gln Asp Tyr Leu Lys Lys Asn Pro Asn Gly Tyr  
195 200 205

Cys His Ile Asn Val Asn Gln Ala Ala Tyr Pro Val Ile Asp Ala Ser  
210 215 220

Lys Tyr Pro Lys Pro Ser Asp Glu Glu Leu Lys Lys Thr Leu Ser Pro  
225 230 235 240

00369707.043604



337

Glu Glu Tyr Ala Val Thr Gln Glu Asn Gln Thr Glu Arg Ala Phe Ser  
245 250 255

Asn Arg Tyr Trp Asp Lys Phe Glu Ser Gly Ile Tyr Val Asp Ile Ala  
260 265 270

Thr Gly Glu Pro Leu Phe Ser Ser Lys Asp Lys Phe Glu Ser Gly Cys  
275 280 285

Gly Trp Pro Ser Phe Thr Gln Pro Ile Ser Pro Asp Val Val Thr Tyr  
290 295 300

Lys Glu Asp Lys Ser Tyr Asn Met Thr Arg Met Glu Val Arg Ser Arg  
305 310 315 320

Val Gly Asp Ser His Leu Gly His Val Phe Thr Asp Gly Pro Gln Asp  
325 330 335

Lys Gly Gly Leu Arg Tyr Cys Ile Asn Ser Leu Ser Ile Arg Phe Ile  
340 345 350

Pro Lys Asp Gln Met Glu Glu Lys Gly Tyr Ala Tyr Leu Leu Asp Tyr  
355 360 365

Val Asp  
370

<210> 161

<211> 338

<212> PRT

<213> Streptococcus pneumoniae

<400> 161

Met Lys Lys Lys Trp Met Tyr Tyr Ala Ala Cys Ser Ser Asn Glu Ser  
1 5 10 15

338

Ala Asp Asp Ser Ser Ser Asp Lys Gly Asp Gly Gly Ser Leu Val Val  
20 25 30

Tyr Ser Pro Asn Ser Glu Gly Leu Ile Gly Ala Thr Ile Pro Ala Phe  
35 40 45

Glu Glu Lys Tyr Gly Ile Lys Val Glu Leu Ile Gln Ala Gly Thr Gly  
50 55 60

Glu Leu Phe Lys Lys Leu Glu Ser Glu Lys Glu Val Pro Val Ala Asp  
65 70 75 80

Val Ile Phe Gly Gly Ser Tyr Thr Gln Tyr Thr Thr His Gly Glu Leu  
85 90 95

Phe Glu Asn Tyr Thr Ser Lys Glu Asn Asp Asn Val Ile Lys Glu Tyr  
100 105 110

Gln Asn Thr Thr Gly Tyr Ser Thr Pro Tyr Thr Leu Asp Gly Ser Val  
115 120 125

Leu Ile Val Asn Pro Asp Leu Thr Lys Gly Met Asn Ile Glu Gly Tyr  
130 135 140

Asn Asp Leu Phe Lys Pro Glu Leu Lys Gly Lys Ile Ala Thr Ala Asp  
145 150 155 160

Pro Ala Asn Ser Ser Ser Ala Phe Ala Gln Leu Thr Asn Met Leu Gln  
165 170 175

Ala Gln Gly Gly Tyr Lys Asp Asp Lys Ala Trp Ser Tyr Val Lys Asp  
180 185 190

Leu Phe Thr Leu Ile Asp Gly Lys Ile Gly Ser Ser Ser Ser Ser Val  
195 200 205

Tyr Lys Val Val Ala Asp Gly Glu Met Ala Val Gly Leu Ser Tyr Glu  
210 215 220

00369707 04504

339

Asp Pro Ala Val Lys Leu Leu Asn Asp Gly Ala Asn Ile Lys Val Val  
225 230 235 240

Tyr Pro Lys Glu Gly Thr Val Phe Leu Pro Ala Ser Ala Ala Ile Val  
245 250 255

Lys Lys Ser Lys Asn Met Glu Asn Ala Lys Lys Phe Ile Asp Phe Ile  
260 265 270

Ile Ser Gln Glu Val Gln Asp Thr Leu Gly Thr Thr Thr Thr Asn Arg  
275 280 285

Pro Val Arg Lys Asn Ala Lys Thr Ser Glu Asn Met Lys Pro Ile Asp  
290 295 300

Lys Ile Lys Thr Leu Thr Glu Asp Tyr Asp Tyr Val Ile Lys Asn Lys  
305 310 315 320

Ser Asp Ile Val Lys Lys Tyr Asn Glu Val Phe Thr Asp Ile Gln Ser  
325 330 335

Lys Gln

<210> 162

<211> 363

<212> PRT

<213> Streptococcus pneumoniae

<400> 162

Met Ser Glu Ile Lys Ile Ile Asn Ala Lys Lys Ile Tyr His Asp Val  
1 5 10 15

Pro Val Ile Glu Asn Leu Asn Ile Thr Ile Pro Lys Gly Ser Leu Phe  
20 25 30

Figure 1 displays 12 histograms, labeled (a) through (l), showing the distribution of the number of non-zero elements in the vector  $x_k$  for  $k = 0, 1, \dots, 11$ . The x-axis for each histogram is labeled  $x_k$  and ranges from 0 to 10. The y-axis is labeled 'count' and ranges from 0 to 10. The distributions are roughly bell-shaped and centered around 5, with the peak count increasing from 10 at  $k=0$  to 12 at  $k=11$ .

Pro Ala Asn Glu Phe Val Ala Thr Phe Ile Gly Arg Thr Asn Ile Ile  
225                    230                    235                    240

341

Pro Ala Asn Leu Glu Lys Arg Ser Asp Gly Ala Tyr Ile Val Phe Ser  
245 250 255

Asp Gly Tyr Ala Leu Arg Met Pro Ala Leu Asp Gln Val Glu Glu Gln  
260 265 270

Ala Ile His Val Ser Ile Arg Pro Glu Glu Phe Ile Lys Asp Glu Ser  
275 280 285

Gly Asp Ile Glu Gly Thr Ile Arg Asp Ser Val Tyr Leu Gly Leu Asn  
290 295 300

Thr Asp Tyr Phe Ile Glu Thr Gly Phe Ala Ser Lys Ile Gln Val Ser  
305 310 315 320

Glu Glu Ser Thr Phe Glu Glu Asp Leu Gln Lys Gly Asn Arg Ile Arg  
325 330 335

Leu Arg Ile Asn Thr Gln Lys Leu Asn Ile Phe Ser Ala Asp Gly Ser  
340 345 350

Gln Asn Leu Ile Lys Gly Val Asn His Gly Thr  
355 360

<210> 163

<211> 313

<212> PRT

<213> Streptococcus pneumoniae

<400> 163

Met Lys Lys Lys Leu Leu Ala Gly Ala Ile Thr Leu Leu Ser Val Ala  
1 5 10 15

Thr Leu Ala Ala Cys Ser Lys Gly Ser Glu Gly Ala Asp Leu Ile Ser  
20 25 30

09269787.042604

Thr Gly Thr Gln Ala Tyr Ser Ser Gln Tyr Tyr Ile Val Lys Leu Thr  
225 230 235 240

[illegible]

Val Gln Pro Arg Thr Val Glu Thr Thr Val Lys Asp Pro Ser Ser Thr  
65 70 75 80

344

Ala Glu Glu Thr Pro Val Leu Glu Lys Asn Asn Val Thr Leu Thr Gly  
85 90 95

Gly Gly Glu Asn Val Thr Lys Glu Leu Lys Asp Lys Phe Thr Ser Gly  
100 105 110

Asp Phe Thr Val Val Ile Lys Tyr Asn Gln Ser Ser Glu Lys Gly Leu  
115 120 125

Gln Ala Leu Phe Gly Ile Ser Asn Ser Lys Pro Gly Gln Gln Asn Ser  
130 135 140

Tyr Val Asp Val Phe Leu Arg Asp Asn Gly Glu Leu Gly Met Glu Ala  
145 150 155 160

Arg Asp Thr Ser Ser Asn Lys Asn Asn Leu Val Ser Arg Pro Ala Ser  
165 170 175

Val Trp Gly Lys Tyr Lys Gln Glu Ala Val Thr Asn Thr Val Ala Val  
180 185 190

Val Ala Asp Ser Val Lys Lys Thr Tyr Ser Leu Tyr Ala Asn Gly Thr  
195 200 205

Lys Val Val Glu Lys Lys Val Asp Asn Phe Leu Asn Ile Lys Asp Ile  
210 215 220

Lys Gly Ile Asp Tyr Tyr Met Leu Gly Gly Val Lys Arg Ala Gly Lys  
225 230 235 240

Thr Ala Phe Gly Phe Asn Gly Thr Leu Glu Asn Ile Lys Phe Phe Asn  
245 250 255

Ser Ala Leu Asp Glu Glu Thr Val Lys Lys Met Thr Thr Asn Ala Val  
260 265 270

Thr Gly His Leu Ile Tyr Thr Ala Asn Asp Thr Thr Gly Ser Asn Tyr  
275 280 285

FOUO 1525260



[illegible]

Arg  
465

&lt;210&gt; 165

&lt;211&gt; 266

&lt;212&gt; PRT

&lt;213&gt; Streptococcus pneumoniae

&lt;400&gt; 165

Met Lys Lys Phe Ser Leu Leu Leu Ala Ile Leu Pro Phe Leu Val Ala

1

5

10

15

Cys Glu Asn Gln Ala Thr Pro Lys Glu Thr Ser Ala Gln Lys Thr Ile

20

25

30

Val Leu Ala Thr Ala Gly Asp Val Pro Pro Phe Asp Tyr Glu Asp Lys

35

40

45

Gly Asn Leu Thr Gly Phe Asp Ile Glu Val Leu Lys Ala Val Asp Glu

50

55

60

Lys Leu Ser Asp Tyr Glu Ile Gln Phe Gln Arg Thr Ala Trp Glu Ser

65

70

75

80

Ile Phe Pro Gly Leu Asp Ser Gly His Tyr Gln Ala Ala Ala Asn Asn

85

90

95

Leu Ser Tyr Thr Lys Glu Arg Ala Glu Lys Tyr Leu Tyr Ser Leu Pro

100

105

110

Ile Ser Asn Asn Pro Leu Val Leu Val Ser Asn Lys Lys Asn Pro Leu

115

120

125

Thr Ser Leu Asp Gln Ile Ala Gly Lys Thr Thr Gln Glu Asp Thr Gly

130

135

140

Thr Ser Asn Ala Gln Phe Ile Asn Asn Trp Asn Gln Lys His Thr Asp

145

150

155

160

Asn Pro Ala Thr Ile Asn Phe Ser Gly Glu Asp Ile Gly Lys Arg Ile

165

170

175

1099210 2826250

347

Leu Asp Leu Ala Asn Gly Glu Phe Asp Phe Leu Val Phe Asp Lys Val  
180 185 190

Ser Val Gln Lys Ile Ile Lys Asp Arg Gly Leu Asp Leu Ser Val Val  
195 200 205

Asp Leu Pro Ser Ala Asp Ser Pro Ser Asn Tyr Ile Ile Phe Ser Ser  
210 215 220

Asp Gln Lys Glu Phe Lys Glu Gln Phe Asp Lys Ala Leu Lys Glu Leu  
225 230 235 240

Tyr Gln Asp Gly Thr Leu Glu Lys Leu Ser Asn Thr Tyr Leu Gly Gly  
245 250 255

Ser Tyr Leu Pro Asp Gln Ser Gln Leu Gln  
260 265

<210> 166

<211> 259

<212> PRT

<213> Streptococcus pneumoniae

<400> 166

Met Lys Lys Asn Ser Leu Tyr Ile Ile Ser Ser Leu Phe Phe Ala Cys  
1 5 10 15

Val Leu Phe Val Tyr Ala Thr Ala Thr Asn Phe Gln Asn Ser Thr Ser  
20 25 30

Ala Arg Gln Val Lys Thr Glu Thr Tyr Thr Asn Thr Val Thr Asn Val  
35 40 45

Pro Ile Asp Ile Arg Tyr Asn Ser Asp Lys Tyr Phe Ile Ser Gly Phe  
50 55 60

348

Ala Ser Glu Val Ser Val Val Leu Thr Gly Ala Asn Arg Leu Ser Leu  
65 70 75 80

Ala Ser Glu Met Gln Glu Ser Thr Arg Lys Phe Lys Val Thr Ala Asp  
85 90 95

Leu Thr Asp Ala Gly Val Gly Thr Ile Glu Val Pro Leu Ser Ile Glu  
100 105 110

Asp Leu Pro Asn Gly Leu Thr Ala Val Ala Thr Pro Gln Lys Ile Thr  
115 120 125

Val Lys Ile Gly Lys Lys Ala Gln Lys Asp Lys Val Lys Ile Val Pro  
130 135 140

Glu Ile Asp Pro Ser Gln Ile Asp Ser Arg Val Gln Ile Glu Asn Val  
145 150 155 160

Met Val Ser Asp Lys Glu Val Ser Ile Thr Ser Asp Gln Glu Thr Leu  
165 170 175

Asp Arg Ile Asp Lys Ile Ile Ala Val Leu Pro Thr Ser Glu Arg Ile  
180 185 190

Thr Gly Asn Tyr Ser Gly Ser Val Pro Leu Gln Ala Ile Asp Arg Asn  
195 200 205

Gly Val Val Leu Pro Ala Val Ile Thr Pro Phe Asp Thr Ile Met Lys  
210 215 220

Val Thr Thr Lys Pro Val Ala Pro Ser Ser Ser Thr Ser Asn Ser Ser  
225 230 235 240

Thr Ser Ser Ser Ser Glu Thr Ser Ser Ser Thr Lys Ala Thr Ser Ser  
245 250 255

Lys Thr Asn

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&lt;210&gt; 167

&lt;211&gt; 263

&lt;212&gt; PRT

&lt;213&gt; Streptococcus pneumoniae

&lt;400&gt; 167

Met Leu Ile Gly Glu Gly Tyr Arg Thr Phe Pro Val Leu Ile Tyr Thr

1

5

10

15

Gln Phe Ile Ser Glu Val Gly Gly Asn Ser Ala Phe Ala Ile Met Ala

20

25

30

Ile Ile Ile Ala Leu Ala Ile Phe Leu Ile Gln Lys His Ile Ala Asn

35

40

45

Arg Tyr Ser Phe Ser Met Asn Leu Leu His Pro Ile Glu Pro Lys Lys

50

55

60

Thr Thr Lys Gly Lys Met Ala Ala Ile Tyr Ala Thr Val Tyr Gly Ile

65

70

75

80

Ile Phe Ile Ser Val Leu Pro Gln Ile Tyr Leu Ile Tyr Thr Ser Phe

85

90

95

Leu Lys Thr Ser Gly Met Val Ser Val Lys Gly Tyr Ser Pro Asn Ser

100

105

110

Tyr Lys Val Ala Phe His Arg Met Gly Ser Ala Ile Phe Asn Thr Ile

115

120

125

Arg Ile Pro Leu Ile Ala Leu Val Leu Val Val Leu Phe Ala Thr Phe

130

135

140

Ile Ser Tyr Leu Ala Val Arg Lys Arg Asn Leu Phe Thr Asn Leu Ile

145

150

155

160

P055210 23269260

350

Asp Ser Leu Ser Met Val Pro Tyr Ile Val Pro Gly Thr Val Leu Gly  
165 170 175

Ile Ala Phe Ile Ser Ser Phe Asn Thr Gly Leu Phe Gly Ser Gly Phe  
180 185 190

Leu Met Ile Thr Gly Thr Ala Phe Ile Leu Ile Met Ser Leu Ser Ala  
195 200 205

Arg Arg Leu Pro Tyr Thr Ile Arg Ser Ser Val Ala Ser Leu Gln Gln  
210 215 220

Ile Ala Pro Ser Ile Glu Glu Ala Ala Glu Ser Leu Gly Ser Ser Arg  
225 230 235 240

Leu Asn Thr Phe Ala Lys Ile Thr Thr Pro Met Met Leu Ser Gly Ile  
245 250 255

Ile Ser Gly Ala Ile Leu Ser  
260

<210> 168

<211> 1332

<212> DNA

<213> Streptococcus pneumoniae

<400> 168

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acatctgatg aaattccaag cttactccag tcttattcaa agtccttgac catatctgct 240  
caccttaaaa gagatattgt agataagcgg ctccctcttg tgcattgactt ggatattaaa 300  
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<210> 169

<211> 873

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 169

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 gacctggagg aactcattcg tgacaaatct taa 873

&lt;210&gt; 170

&lt;211&gt; 459

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 170

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gatacacttt cagaaatcgc tgaaactcac aacacaacag ttgaaaaatt ggagaaaaac 180  
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actgtttcag ctccagtagc agaaactcca gtagtaagt aaacagttgt ttcaactgta 360  
agcggatctg aagcagaagc caaagaatgg atcgctcaaa aagaatcagg tggtagtata 420  
cagctacaaa tggacgttat atcggcggtt accaattaa 459

&lt;210&gt; 171

&lt;211&gt; 2034

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 171

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atggctagtg atggtacttg gcaaggaaaa cagtatctga aagaagatgg cagtcaagca 180  
gcaaatgagt ggggtttttga tactcattat caatcttggg tctatataaa agcagatgct 240  
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09769787 045504



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 ggaatttttag gtgcaaccaa gtggattaag gaaaattata tcgatagggg aagaactttc 1920  
 cttggaaaaca aggtctctgg tatgaatgtg gaatatgctt cagaccctta ttggggcgaa 1980  
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<210> 172

<211> 930

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 172

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 atcatcgctg atattactaa aaatattgct ggtgacaaaa ttgaccttca tagtatcggt 180  
 ccgattgggc aagaccaca cgaatacgaa ccacttctcg aagacgttaa gaaaacttct 240  
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 ggcgttgatg ttatctacct tgaaggtcaa aatgaaaaag gaaaagaaga cccacacgct 420  
 tggcttaacc ttgaaaacgg tattatTTTT gctaaaaata tcgccaaaca attgagcgcc 480  
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 attgtaacca gcgaaggagc attcaaatac ttctctaaag cctatggtgt cccaagtgtc 660  
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gaaaaaacttc gccaaacaaa agttccatca ctctttttag aatcaagtgt ggatgaccgt 780  
 ccaatgaaaa ctgttttctca agacacaaa atcccaatct acgctcaa atcttactgac 840  
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 gacaagattg ctgaaggatt ggcaaaataa 930

<210> 173

<211> 1260

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 173

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 cctaagatca aggtcaaagt cgtcaatgta ccaaagtctg gtgaagtatt gaagacacgc 240  
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 cctgaaacct gggatgaatt tgaacagtta gtcaaagata tcgttgctaa aggacaaaca 540  
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&lt;210&gt; 174

&lt;211&gt; 1680

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 174

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 actggacagg aggatcctga gcgctttaac ccgagtcagt tggatgcgcg tgagtgggtt 180  
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 ggaaagggcg acttgctcct tgaagtatcc caagctgcc aagagtttga tatggatatg 360  
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00969797-019694

&lt;210&gt; 175

&lt;211&gt; 684

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 175

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 ctattttagt tggcatatth ggggtgttta acaactaaga gccagcgctt atcttggcta 180  
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 gccttgcagt tatttcagat ggaggcttat ccacaggtgg aaaaggaatt aaaagaaatt 660  
 caccagatca gcaaggatcc atga 684

&lt;210&gt; 176

&lt;211&gt; 1113

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 176

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<210> 177

<211> 1017

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 177

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 tcagatatcg ttaagaaata caacgaagtc tttacagata tccaatctaa acagtaa 1017

&lt;210&gt; 178

&lt;211&gt; 1092

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 178

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 gggaaaacga cccttcttcg tatgattgca ggtttcaaca gtatcgaagg tggagaattt 180  
 tacttcgatg atacaaaaat caataatatg gaacccagca aacgcaatat cgggatgggt 240  
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 cttggactaa atacggatta tttcattgag acaggttttg cctcaaaaat tcaagttagt 960  
 gaagaatcaa cttttgaaga agatctacaa aaaggcaatc gtattcgtct acgaatcaat 1020  
 acgcaaaaat taaacatctt ttctgcagat gggtcccaaa acctgataaa aggagtcaac 1080  
 catggaacgt aa 1092

&lt;210&gt; 179

&lt;211&gt; 942

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 179

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 accatccaaa aagtttttga aaaacaatat ggctcagagc ttgatgataa agaggttgat 240  
 gatactattg ccgaagaaaa aaaacaatat ggcgaaaact accaacgtgt cttgtcacia 300

gcaggtatga ctcttgaaac acgtaaagct caaatcgtta caagtaaatt agttgagttg 360  
gcagttaaga aggttagcaga agctgaattg acagatgaag cctataagaa agcctttgat 420  
gagtacactc cagatgtaac ggctcaaato atccgtctta ataataaga taaggccaaa 480  
gaagttctcg aaaaagccaa ggcagaaggt gctgattttg ctcaattagc caaagataat 540  
tcaactgatg aaaaaacaaa agaaaatggt ggagaaatta cctttgattc tgcttcaaca 600  
gaagtacctg agcaagtcaa aaaagccgct ttcgcttttag atgtggatgg tgtttctgat 660  
gtgattacag caactggcac acaagcctac agtagccaat attacattgt aaaactcact 720  
aagaaaacag aaaaatcatc taatattgat gactacaaag aaaaattaaa aactgttatt 780  
ttgactcaaa aacaaaatga ttcaacattt gttcaaagca ttatcggaag agaattgcaa 840  
gcagccaata tcaaggttaa ggaccaagcc ttccaaaata tctttaccca atatatcgg 900  
ggtggagatt caagctcaag cagtagtaca tcaaacgaat ag 942

<210> 180

<211> 1395

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 180

atgaaaaaaaa atattaaaca atatgtaacc ttaggtactg tagtggattt atcagcattt 60  
gttgetaact cagttgcagc tcaggagact gaaacttctg aagtatcaac accaaagttg 120  
gtgcaacctg ttgcaccaac gactccgatt tcggaagtac aacctacatc ggataactct 180  
tcggaagtta ctgtacaacc tcgaacagtt gaaactactg ttaaggatcc atcttctaca 240  
gcggaagaaa ctctgtctt agaaaaaaaaat aatgttactt taacaggggg cgagaaaaat 300  
gttactaaag agttaaaagga taaatttact agcggtgact ttactgtagt gattaagtac 360  
aatcagtcaa gtgagaaagg cttacaagct ctgtttggaa tatctaattc caaaccgggt 420  
caacaaaata gttatgtaga tgtgttcctt agagacaatg gtgagttggg gatggaagcg 480  
cgtgatactt cttccaataa aaataaccta gtatccagac ctgcttcagt ttggggtaag 540  
tacaaacaag aggctgtgac taacactggt gcagtagtag cagattcagt caaaaaaaca 600  
tattctttat acgcaaagtg tacaaaagta gttagaaaga aagtggataa tttcctaaac 660  
atcaaggata ttaaagggtat tgattactat atgcttgggg gagtgaaacg tgcaggaaaa 720  
acggcgtttg gttttaacgg aacactagaa aatatcaaat tctttaatag tgcattggat 780  
gaagaaactg ttaaaaagat gacaacaaac gctgttactg gacatttaatt ttatacggct 840  
aatgatacaa caggttctaa ctatttccgt attccagttc tgtatacttt tagcaatgg 900  
cgggtatttt caagcattga cgctcggtac ggtggaactc atgatttctt gaataaaaatt 960  
aatattgcta caagttatag tgatgataat ggtaagacat ggactaaacc aaaattaaca 1020  
ttggcattcg atgattttgc gccagtacca ttagaatggc ctcgtgaagt tgggtggacgt 1080  
gacttacaaa tcagcgggtg tgcaacctat attgactctg ttattgttga aaaaaagaac 1140

aaacaagtac tcatgtttgc tgatgtgatg cctgctggag taagtttttag agaagcaact 1200  
 agaaaagatt caggttataa acaaattgat ggtaattatt accttaaatt aaggaaacaa 1260  
 ggtgatactg attacaatta tactattcgt gagaatggta ctgtatacga cgatcgtacc 1320  
 aacagaccaa ctgaattttc agtagataaa aatttcggta ttaaacaaaa tggtaattat 1380  
 ttgacggtag agcgg 1395

<210> 181

<211> 801

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 181

atgaaaaaat ttagcctatt actagctatc ctaccatttt tggttgcctg tgagaatcaa 60  
 gctacaccca aagagactag cgctcaaaag acaatcgtcc ttgctacagc tggcgacgtg 120  
 ccaccatttg actacgaaga caagggcaat ctgacaggct ttgatatcga agttttaaag 180  
 gcagtagatg aaaaactcag cgactacgag attcaattcc aaagaaccgc ctgggagagc 240  
 atcttcccag gacttgattc tggtcactat caggctgcgg ccaataactt gagttacaca 300  
 aaagagcgtg ctgaaaaata cctttactcg cttccaattt ccaacaatcc cctcgtcctt 360  
 gtcagcaaca agaaaaatcc tttgacttct cttgaccaga tcgctggtaa aacaacacaa 420  
 gaggataccg gaacttctaa cgctcaatcc atcaataact ggaatcagaa acacactgat 480  
 aatcccgtc caattaattt ttctgggtgag gatattggta aacgaatcct agaccttgct 540  
 aacggagagt ttgatttct agtttttgac aaggatatcc ttcaaaagat tatcaaggac 600  
 cgtgggttag acctctcagt cgttgattta ccttctgcag atagccccag caattatatt 660  
 attttctcaa ggcacaaaa agagttttaa gagcaatttg ataaagcgct caaagaactc 720  
 tatcaagacg gaacccttga aaaactcagc aatacctatc taggtggttc ttacctcca 780  
 gatcaatctc agttacaata a 801

<210> 182

<211> 780

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 182

atgaaaaaaaa atagtttata tatcatatcc tcaactcttt ttgcttgtgt cttatttgtc 60  
 tatgctacgg cgacgaattt tcaaaacagt accagtgcga ggcaggtaaa aacggaaacc 120  
 tatactaata cagtaacaaa tgtccctatt gacatacgct ataatagtga taagtatttt 180



atgttgattg	gcgaagggtg	toggactttc	cctgtcctga	tttataccca	at ttattagc	60
gaggttgag	gaaattctgc	ttttgcaatt	atggcgatta	tcattgcctt	ggcaattttc	120
cttatccaaa	aacacattgc	aaaccgctac	agtttcagca	tgaatctgct	ccatccaatt	180
gagcctaaaa	aaactacaaa	aggaaaaatg	gctgccattt	atgcaacagt	ctacggaatt	240
atctttatct	ctgtttttacc	tcaaattctac	ttaatttata	cctctttcct	aaaaacatca	300
ggtatggtat	ctgttaaagg	ttattctcca	aacagttaca	aggtagcttt	ccatcgtatg	360
ggatctgcta	ttttcaatac	cattcgtatc	cctttgattg	ccttagttct	agttgttcta	420
tttgcgacat	ttatctocta	cctagccggt	agaaaacgga	at ttgtttac	aaacttaatt	480
gacagcctca	gtatggtacc	ttatattgta	ccaggaaccg	ttctagggat	tgoccttcatt	540
tcttccttca	atactggtct	at ttggaagt	ggatttctta	tgattacagg	gactgctttc	600
atottgatta	tgtctctatc	tgccagaaga	ttaccttata	ctattogctc	atctgttgct	660
agcttacaac	aaatagcacc	aagtattgaa	gaagctgctg	aaagcttagg	aagtagtcgt	720
ctcaataacct	ttgctaagat	tacaactcca	atgatgctat	ctggatatcat	ttctggagcc	780
atcttatctt	ga					792

&lt;210&gt; 184

&lt;211&gt; 744

&lt;212&gt; PRT

&lt;213&gt; Streptococcus pneumoniae

&lt;400&gt; 184

Met Asn Lys Lys Lys Met Ile Leu Thr Ser Leu Ala Ser Val Ala Ile

1 5 10 15

Leu Gly Ala Gly Phe Val Thr Ser Gln Pro Thr Phe Val Arg Ala Glu

20 25 30

Glu Ser Pro Gln Val Val Glu Lys Ser Ser Leu Glu Lys Lys Tyr Glu

35 40 45

Glu Ala Lys Ala Lys Ala Asp Thr Ala Lys Lys Asp Tyr Glu Thr Ala

50 55 60

Lys Lys Lys Ala Glu Asp Ala Gln Lys Lys Tyr Glu Asp Asp Gln Lys

65 70 75 80

Arg Thr Glu Glu Lys Ala Arg Lys Glu Ala Glu Ala Ser Gln Lys Leu

85 90 95

Asn Asp Val Ala Leu Val Val Gln Asn Ala Tyr Lys Glu Tyr Arg Glu

100 105 110

Val Gln Asn Gln Arg Ser Lys Tyr Lys Ser Asp Ala Glu Tyr Gln Lys

115 120 125

Lys Leu Thr Glu Val Asp Ser Lys Ile Glu Lys Ala Arg Lys Glu Gln

130 135 140

Gln Asp Leu Gln Asn Lys Phe Asn Glu Val Arg Ala Val Val Val Pro

145 150 155 160

Glu Pro Asn Ala Leu Ala Glu Thr Lys Lys Lys Ala Glu Glu Ala Lys

165 170 175

00559797 043604

363

Ala Glu Glu Lys Val Ala Lys Arg Lys Tyr Asp Tyr Ala Thr Leu Lys  
180 185 190

Val Ala Leu Ala Lys Lys Glu Val Glu Ala Lys Glu Leu Glu Ile Glu  
195 200 205

Lys Leu Gln Tyr Glu Ile Ser Thr Leu Glu Gln Glu Val Ala Thr Ala  
210 215 220

Gln His Gln Val Asp Asn Leu Lys Lys Leu Leu Ala Gly Ala Asp Pro  
225 230 235 240

Asp Asp Gly Thr Glu Val Ile Glu Ala Lys Leu Lys Lys Gly Glu Ala  
245 250 255

Glu Leu Asn Ala Lys Gln Ala Glu Leu Ala Lys Lys Gln Thr Glu Leu  
260 265 270

Glu Lys Leu Leu Asp Ser Leu Asp Pro Glu Gly Lys Thr Gln Asp Glu  
275 280 285

Leu Asp Lys Glu Ala Glu Glu Ala Glu Leu Asp Lys Lys Ala Asp Glu  
290 295 300

Leu Gln Asn Lys Val Ala Asp Leu Glu Lys Glu Ile Ser Asn Leu Glu  
305 310 315 320

Ile Leu Leu Gly Gly Ala Asp Pro Glu Asp Asp Thr Ala Ala Leu Gln  
325 330 335

Asn Lys Leu Ala Ala Lys Lys Ala Glu Leu Ala Lys Lys Gln Thr Glu  
340 345 350

Leu Glu Lys Leu Leu Asp Ser Leu Asp Pro Glu Gly Lys Thr Gln Asp  
355 360 365

Glu Leu Asp Lys Glu Ala Glu Glu Ala Glu Leu Asp Lys Lys Ala Asp  
370 375 380

007507 013604

[illegible]

Tyr Leu Glu Ala Ser Gly Ala Met Lys Ala Ser Gln Trp Phe Lys Val  
580 585 590

365

Ser Asp Lys Trp Tyr Tyr Val Asn Ser Asn Gly Ala Met Ala Thr Gly  
595 600 605

Trp Leu Gln Tyr Asn Gly Ser Trp Tyr Tyr Leu Asn Ala Asn Gly Asp  
610 615 620

Met Ala Thr Gly Trp Leu Gln Tyr Asn Gly Ser Trp Tyr Tyr Leu Asn  
625 630 635 640

Ala Asn Gly Asp Met Ala Thr Gly Trp Ala Lys Val Asn Gly Ser Trp  
645 650 655

Tyr Tyr Leu Asn Ala Asn Gly Ala Met Ala Thr Gly Trp Ala Lys Val  
660 665 670

Asn Gly Ser Trp Tyr Tyr Leu Asn Ala Asn Gly Ser Met Ala Thr Gly  
675 680 685

Trp Val Lys Asp Gly Asp Thr Trp Tyr Tyr Leu Glu Ala Ser Gly Ala  
690 695 700

Met Lys Ala Ser Gln Trp Phe Lys Val Ser Asp Lys Trp Tyr Tyr Val  
705 710 715 720

Asn Gly Leu Gly Ala Leu Ala Val Asn Thr Thr Val Asp Gly Tyr Lys  
725 730 735

Val Asn Ala Asn Gly Glu Trp Val  
740

<210> 185

<211> 693

<212> PRT

<213> Streptococcus pneumoniae

<400> 185

Met Phe Ala Ser Lys Ser Glu Arg Lys Val His Tyr Ser Ile Arg Lys

1

5

10

15

00369757-013504

366

Phe Ser Val Gly Val Ala Ser Val Val Val Ala Ser Leu Val Met Gly  
20 25 30

Ser Val Val His Ala Thr Glu Asn Glu Gly Ala Thr Gln Val Pro Thr  
35 40 45

Ser Ser Asn Arg Ala Asn Glu Ser Gln Ala Glu Gln Gly Glu Gln Pro  
50 55 60

Lys Lys Leu Asp Ser Glu Arg Asp Lys Ala Arg Lys Glu Val Glu Glu  
65 70 75 80

Tyr Val Lys Lys Ile Val Gly Glu Ser Tyr Ala Lys Ser Thr Lys Lys  
85 90 95

Arg His Thr Ile Thr Val Ala Leu Val Asn Glu Leu Asn Asn Ile Lys  
100 105 110

Asn Glu Tyr Leu Asn Lys Ile Val Glu Ser Thr Ser Glu Ser Gln Leu  
115 120 125

Gln Ile Leu Met Met Glu Ser Arg Ser Lys Val Asp Glu Ala Val Ser  
130 135 140

Lys Phe Glu Lys Asp Ser Ser Ser Ser Ser Ser Ser Asp Ser Ser Thr  
145 150 155 160

Lys Pro Glu Ala Ser Asp Thr Ala Lys Pro Asn Lys Pro Thr Glu Pro  
165 170 175

Gly Glu Lys Val Ala Glu Ala Lys Lys Lys Val Glu Glu Ala Glu Lys  
180 185 190

Lys Ala Lys Asp Gln Lys Glu Glu Asp Arg Arg Asn Tyr Pro Thr Ile  
195 200 205

Thr Tyr Lys Thr Leu Glu Leu Glu Ile Ala Glu Ser Asp Val Glu Val  
210 215 220

00769707 043604

367

Lys Lys Ala Glu Leu Glu Leu Val Lys Val Lys Ala Asn Glu Pro Arg  
225 230 235 240

Asp Glu Gln Lys Ile Lys Gln Ala Glu Ala Glu Val Glu Ser Lys Gln  
245 250 255

Ala Glu Ala Thr Arg Leu Lys Lys Ile Lys Thr Asp Arg Glu Glu Ala  
260 265 270

Glu Glu Glu Ala Lys Arg Arg Ala Asp Ala Lys Glu Gln Gly Lys Pro  
275 280 285

Lys Gly Arg Ala Lys Arg Gly Val Pro Gly Glu Leu Ala Thr Pro Asp  
290 295 300

Lys Lys Glu Asn Asp Ala Lys Ser Ser Asp Ser Ser Val Gly Glu Glu  
305 310 315 320

Thr Leu Pro Ser Pro Ser Leu Lys Pro Glu Lys Lys Val Ala Glu Ala  
325 330 335

Glu Lys Lys Val Glu Glu Ala Lys Lys Lys Ala Glu Asp Gln Lys Glu  
340 345 350

Glu Asp Arg Arg Asn Tyr Pro Thr Asn Thr Tyr Lys Thr Leu Glu Leu  
355 360 365

Glu Ile Ala Glu Ser Asp Val Glu Val Lys Lys Ala Glu Leu Glu Leu  
370 375 380

Val Lys Glu Glu Ala Lys Glu Pro Arg Asn Glu Glu Lys Val Lys Gln  
385 390 395 400

Ala Lys Ala Glu Val Glu Ser Lys Lys Ala Glu Ala Thr Arg Leu Glu  
405 410 415

Lys Ile Lys Thr Asp Arg Lys Lys Ala Glu Glu Glu Ala Lys Arg Lys  
420 425 430

09769787 042504

Tyr Tyr Leu Asn Ala Asn Gly Asp Met Ala Thr Gly Trp Val Lys Asp  
625 630 635 640



369

Gly Asp Thr Trp Tyr Tyr Leu Glu Ala Ser Gly Ala Met Lys Ala Ser  
645 650 655

Gln Trp Phe Lys Val Ser Asp Lys Trp Tyr Tyr Val Asn Gly Ser Gly  
660 665 670

Ala Leu Ala Val Asn Thr Thr Val Asp Gly Tyr Gly Val Asn Ala Asn  
675 680 685

Gly Glu Trp Val Asn  
690

<210> 186

<211> 129

<212> PRT

<213> Streptococcus pneumoniae

<400> 186

Met Val Lys Arg Arg Ile Arg Arg Gly Thr Arg Glu Pro Glu Lys Val  
1 5 10 15

Val Val Pro Glu Gln Ser Ser Ile Pro Ser Tyr Pro Val Ser Val Thr  
20 25 30

Ser Asn Gln Gly Thr Asp Val Ala Val Glu Pro Ala Lys Ala Val Ala  
35 40 45

Pro Thr Thr Asp Trp Lys Gln Glu Asn Gly Met Trp Tyr Phe Tyr Asn  
50 55 60

Thr Asp Gly Ser Met Ala Thr Gly Trp Val Gln Val Asn Ser Ser Trp  
65 70 75 80

Tyr Tyr Leu Asn Ser Asn Gly Ser Met Lys Val Asn Gln Trp Phe Gln  
85 90 95

00260997.013604

370

Val Gly Gly Lys Trp Tyr Tyr Val Asn Thr Ser Gly Glu Leu Ala Val  
100 105 110

Asn Thr Ser Ile Asp Gly Tyr Arg Val Asn Asp Asn Gly Glu Trp Val  
115 120 125

Arg

<210> 187

<211> 230

<212> PRT

<213> Streptococcus pneumoniae

<400> 187

Leu Asn Thr Ser Phe Val His Ala Ala Asp Gly Ile Gln Tyr Val Arg  
1 5 10 15

Asp Asp Thr Arg Asp Lys Glu Glu Gly Ile Glu Tyr Asp Asp Ala Asp  
20 25 30

Asn Gly Asp Ile Ile Val Lys Val Ala Thr Lys Pro Lys Val Val Thr  
35 40 45

Lys Lys Ile Ser Ser Thr Arg Ile Arg Tyr Glu Lys Asp Glu Thr Lys  
50 55 60

Asp Arg Ser Glu Asn Pro Val Thr Ile Asp Gly Glu Asp Gly Tyr Val  
65 70 75 80

Thr Thr Thr Arg Thr Tyr Asp Val Asn Pro Glu Thr Gly Tyr Val Thr  
85 90 95

Glu Gln Val Thr Val Asp Arg Lys Glu Ala Thr Asp Thr Val Ile Lys  
100 105 110

00369797 043604

371

Val Pro Ala Lys Ser Lys Val Glu Glu Val Leu Val Pro Phe Ala Thr  
115 120 125

Lys Tyr Glu Ala Asp Asn Asp Leu Ser Ala Gly Gln Glu Gln Glu Ile  
130 135 140

Thr Leu Gly Lys Asn Gly Lys Thr Val Thr Thr Ile Thr Tyr Asn Val  
145 150 155 160

Asp Gly Lys Ser Gly Gln Val Thr Glu Ser Thr Leu Ser Gln Lys Lys  
165 170 175

Asp Ser Gln Thr Arg Val Val Lys Lys Arg Thr Lys Pro Gln Val Leu  
180 185 190

Val Gln Glu Ile Pro Ile Glu Thr Glu Tyr Leu Asp Gly Pro Thr Leu  
195 200 205

Asp Lys Ser Gln Glu Val Glu Glu Val Gly Glu Ile Gly Lys Leu Leu  
210 215 220

Leu Leu Gln Ser Ile Leu  
225 230

<210> 188

<211> 340

<212> PRT

<213> Streptococcus pneumoniae

<400> 188

Met Lys Leu Leu Lys Lys Met Met Gln Ile Ala Leu Ala Thr Phe Phe  
1 5 10 15

Phe Gly Leu Leu Ala Thr Asn Thr Val Phe Ala Asp Asp Ser Glu Gly  
20 25 30

Trp Gln Phe Val Gln Glu Asn Gly Arg Thr Tyr Tyr Lys Lys Gly Asp  
35 40 45

Leu Lys Glu Thr Tyr Trp Arg Val Ile Asp Gly Lys Tyr Tyr Tyr Phe  
50 55 60

Asp Pro Leu Ser Gly Glu Met Val Val Gly Trp Gln Tyr Ile Pro Ala  
65 70 75 80

Pro His Lys Gly Val Thr Ile Gly Pro Ser Pro Arg Ile Glu Ile Ala  
85 90 95

Leu Arg Pro Asp Trp Phe Tyr Phe Gly Gln Asp Gly Val Leu Gln Glu  
100 105 110

Phe Val Gly Lys Gln Val Leu Glu Ala Lys Thr Ala Thr Asn Thr Asn  
115 120 125

Lys His His Gly Glu Glu Tyr Asp Ser Gln Ala Glu Lys Arg Val Tyr  
130 135 140

Tyr Phe Glu Asp Gln Arg Ser Tyr His Thr Leu Lys Thr Gly Trp Ile  
145 150 155 160

Tyr Glu Glu Gly His Trp Tyr Tyr Leu Gln Lys Asp Gly Gly Phe Asp  
165 170 175

Ser Arg Ile Asn Arg Leu Thr Val Gly Glu Leu Ala Arg Gly Trp Val  
180 185 190

Lys Asp Tyr Pro Leu Thr Tyr Asp Glu Glu Lys Leu Lys Ala Ala Pro  
195 200 205

Trp Tyr Tyr Leu Asn Pro Ala Thr Gly Ile Met Gln Thr Gly Trp Gln  
210 215 220

Tyr Leu Gly Asn Arg Trp Tyr Tyr Leu His Ser Ser Gly Ala Met Ala  
225 230 235 240

09760707 045601

373

Thr Gly Trp Tyr Lys Glu Gly Ser Thr Trp Tyr Tyr Leu Asp Ala Glu  
245 250 255

Asn Gly Asp Met Arg Thr Gly Trp Gln Asn Leu Gly Asn Lys Trp Tyr  
260 265 270

Tyr Leu Arg Ser Ser Gly Ala Met Ala Thr Gly Trp Tyr Gln Glu Ser  
275 280 285

Ser Thr Trp Tyr Tyr Leu Asn Ala Ser Asn Gly Asp Met Lys Thr Gly  
290 295 300

Trp Phe Gln Val Asn Gly Asn Trp Tyr Tyr Ala Tyr Asp Ser Gly Ala  
305 310 315 320

Leu Ala Val Asn Thr Thr Val Gly Gly Tyr Tyr Leu Asn Tyr Asn Gly  
325 330 335

Glu Trp Val Lys  
340

<210> 189

<211> 181

<212> PRT

<213> Streptococcus pneumoniae

<400> 189

Leu Ala Gly Arg Tyr Gly Ser Ala Val Gln Cys Thr Glu Val Thr Ala  
1 5 10 15

Ser Asn Leu Ser Thr Val Lys Thr Lys Ala Thr Val Val Glu Lys Pro  
20 25 30

Leu Lys Asp Phe Arg Ala Ser Thr Ser Asp Gln Ser Gly Trp Val Glu  
35 40 45

009270 28269260

374

Ser Asn Gly Lys Trp Tyr Phe Tyr Glu Ser Gly Asp Val Lys Thr Gly  
50 55 60

Trp Val Lys Thr Asp Gly Lys Trp Tyr Tyr Leu Asn Asp Leu Gly Val  
65 70 75 80

Met Gln Thr Gly Phe Val Lys Phe Ser Gly Ser Trp Tyr Tyr Leu Ser  
85 90 95

Asn Ser Gly Ala Met Phe Thr Gly Trp Gly Thr Asp Gly Ser Arg Trp  
100 105 110

Phe Tyr Phe Asp Gly Ser Gly Ala Met Lys Thr Gly Trp Tyr Lys Glu  
115 120 125

Asn Gly Thr Trp Tyr Tyr Leu Asp Glu Ala Gly Ile Met Lys Thr Gly  
130 135 140

Trp Phe Lys Val Gly Pro His Trp Tyr Tyr Ala Tyr Gly Ser Gly Ala  
145 150 155 160

Leu Ala Val Ser Thr Thr Thr Pro Asp Gly Tyr Arg Val Asn Gly Asn  
165 170 175

Gly Glu Trp Val Asn  
180

<210> 190

<211> 332

<212> PRT

<213> Streptococcus pneumoniae

<400> 190

Met Lys Ile Leu Lys Lys Thr Met Gln Val Gly Leu Thr Val Phe Phe  
1 5 10 15

00769797 013504

Gly Ile Met Gln Thr Gly Trp Gln Tyr Leu Gly Asn Lys Trp Tyr Tyr  
210 215 220

376

Leu Arg Ser Ser Gly Ala Met Ala Thr Gly Trp Tyr Gln Glu Gly Thr  
225 230 235 240

Thr Trp Tyr Tyr Leu Asp His Pro Asn Gly Asp Met Lys Thr Gly Trp  
245 250 255

Gln Asn Leu Gly Asn Lys Trp Tyr Tyr Leu Arg Ser Ser Gly Ala Met  
260 265 270

Ala Thr Gly Trp Tyr Gln Asp Gly Ser Thr Trp Tyr Tyr Leu Asn Ala  
275 280 285

Gly Asn Gly Asp Met Lys Thr Gly Trp Phe Gln Val Asn Gly Asn Trp  
290 295 300

Tyr Tyr Ala Tyr Ser Ser Gly Ala Leu Ala Val Asn Thr Thr Val Asp  
305 310 315 320

Gly Tyr Ser Val Asn Tyr Asn Gly Glu Trp Val Arg  
325 330

<210> 191

<211> 627

<212> PRT

<213> Streptococcus pneumoniae

<400> 191

Met Lys Lys Lys Leu Thr Ser Leu Ala Leu Val Gly Ala Phe Leu Gly  
1 5 10 15

Leu Ser Trp Tyr Gly Asn Val Gln Ala Gln Glu Ser Ser Gly Asn Lys  
20 25 30

Ile His Phe Ile Asn Val Gln Glu Gly Gly Ser Asp Ala Ile Ile Leu  
35 40 45

009597.01601



Glu Ser Asn Gly His Phe Ala Met Val Asp Thr Gly Glu Asp Tyr Asp  
 50 55 60

Phe Pro Asp Gly Ser Asp Ser Arg Tyr Pro Trp Arg Glu Gly Ile Glu  
 65 70 75 80

Thr Ser Tyr Lys His Val Leu Thr Asp Arg Val Phe Arg Arg Leu Lys  
 85 90 95

Glu Leu Gly Val Gln Lys Leu Asp Phe Ile Leu Val Thr His Thr His  
 100 105 110

Ser Asp His Ile Gly Asn Val Asp Glu Leu Leu Ser Thr Tyr Pro Val  
 115 120 125

Asp Arg Val Tyr Leu Lys Lys Tyr Ser Asp Ser Arg Ile Thr Asn Ser  
 130 135 140

Glu Arg Leu Trp Asp Asn Leu Tyr Gly Tyr Asp Lys Val Leu Gln Thr  
 145 150 155 160

Ala Ala Glu Lys Gly Val Ser Val Ile Gln Asn Ile Thr Gln Gly Asp  
 165 170 175

Ala His Phe Gln Phe Gly Asp Met Asp Ile Gln Leu Tyr Asn Tyr Glu  
 180 185 190

Asn Glu Thr Asp Ser Ser Gly Glu Leu Lys Lys Ile Trp Asp Asp Asn  
 195 200 205

Ser Asn Ser Leu Ile Ser Val Val Lys Val Asn Gly Lys Lys Ile Tyr  
 210 215 220

Leu Gly Gly Asp Leu Asp Asn Val His Gly Ala Glu Asp Lys Tyr Gly  
 225 230 235 240

Pro Leu Ile Gly Lys Val Asp Leu Met Lys Phe Asn His His His Asp  
 245 250 255

109210 1969260

378

Thr Asn Lys Ser Asn Thr Lys Asp Phe Ile Lys Asn Leu Ser Pro Ser  
260 265 270

Leu Ile Val Gln Thr Ser Asp Ser Leu Pro Trp Lys Asn Gly Val Asp  
275 280 285

Ser Glu Tyr Val Asn Trp Leu Lys Glu Arg Gly Ile Glu Arg Ile Asn  
290 295 300

Ala Ala Ser Lys Asp Tyr Asp Ala Thr Val Phe Asp Ile Arg Lys Asp  
305 310 315 320

Gly Phe Val Asn Ile Ser Thr Ser Tyr Lys Pro Ile Pro Ser Phe Gln  
325 330 335

Ala Gly Trp His Lys Ser Ala Tyr Gly Asn Trp Trp Tyr Gln Ala Pro  
340 345 350

Asp Ser Thr Gly Glu Tyr Ala Val Gly Trp Asn Glu Ile Glu Gly Glu  
355 360 365

Trp Tyr Tyr Phe Asn Gln Thr Gly Ile Leu Leu Gln Asn Gln Trp Lys  
370 375 380

Lys Trp Asn Asn His Trp Phe Tyr Leu Thr Asp Ser Gly Ala Ser Ala  
385 390 395 400

Lys Asn Trp Lys Lys Ile Ala Gly Ile Trp Tyr Tyr Phe Asn Lys Glu  
405 410 415

Asn Gln Met Glu Ile Gly Trp Ile Gln Asp Lys Glu Gln Trp Tyr Tyr  
420 425 430

Leu Asp Val Asp Gly Ser Met Lys Thr Gly Trp Leu Gln Tyr Met Gly  
435 440 445

Gln Trp Tyr Tyr Phe Ala Pro Ser Gly Glu Met Lys Met Gly Trp Val  
450 455 460

00760707 013501

[illegible]

Lys Asp Lys Glu Thr Trp Tyr Tyr Met Asp Ser Thr Gly Val Met Lys  
465 470 475 480

Thr Gly Glu Ile Glu Val Ala Gly Gln His Tyr Tyr Leu Glu Asp Ser  
485 490 495

Gly Ala Met Lys Gln Gly Trp His Lys Lys Ala Asn Asp Trp Tyr Phe  
500 505 510

Tyr Lys Thr Asp Gly Ser Arg Ala Val Gly Trp Ile Lys Asp Lys Asp  
515 520 525

Lys Trp Tyr Phe Leu Lys Glu Asn Gly Gln Leu Leu Val Asn Gly Lys  
530 535 540

Thr Pro Glu Gly Tyr Thr Val Asp Ser Ser Gly Ala Trp Leu Val Asp  
545 550 555 560

Val Ser Ile Glu Lys Ser Ala Thr Ile Lys Thr Thr Ser His Ser Glu  
565 570 575

Ile Lys Glu Ser Lys Glu Val Val Lys Lys Asp Leu Glu Asn Lys Glu  
580 585 590

Thr Ser Gln His Glu Ser Val Thr Asn Phe Ser Thr Ser Gln Asp Leu  
595 600 605

Thr Ser Ser Thr Ser Gln Ser Ser Glu Thr Ser Val Asn Lys Ser Glu  
610 615 620

Ser Glu Gln  
625

&lt;210&gt; 192

&lt;211&gt; 318

&lt;212&gt; PRT

&lt;213&gt; Streptococcus pneumoniae

&lt;400&gt; 192

Met Glu Ile Asn Val Ser Lys Leu Arg Thr Asp Leu Pro Gln Val Gly

1

5

10

15

Val Gln Pro Tyr Arg Gln Val His Ala His Ser Thr Gly Asn Pro His

20

25

30

Ser Thr Val Gln Asn Glu Ala Asp Tyr His Trp Arg Lys Asp Pro Glu

35

40

45

Leu Gly Phe Phe Ser His Ile Val Gly Asn Gly Cys Ile Met Gln Val

50

55

60

Gly Pro Val Asp Asn Gly Ala Trp Asp Val Gly Gly Gly Trp Asn Ala

65

70

75

80

Glu Thr Tyr Ala Ala Val Glu Leu Ile Glu Ser His Ser Thr Lys Glu

85

90

95

Glu Phe Met Thr Asp Tyr Arg Leu Tyr Ile Glu Leu Leu Arg Asn Leu

100

105

110

Ala Asp Glu Ala Gly Leu Pro Lys Thr Leu Asp Thr Gly Ser Leu Ala

115

120

125

Gly Ile Lys Thr His Glu Tyr Cys Thr Asn Asn Gln Pro Asn Asn His

130

135

140

Ser Asp His Val Asp Pro Tyr Pro Tyr Leu Ala Lys Trp Gly Ile Ser

145

150

155

160

Arg Glu Gln Phe Lys His Asp Ile Glu Asn Gly Leu Thr Ile Glu Thr

165

170

175

00359797 042604

381

Gly Trp Gln Lys Asn Asp Thr Gly Tyr Trp Tyr Val His Ser Asp Gly  
180 185 190

Ser Tyr Pro Lys Asp Lys Phe Glu Lys Ile Asn Gly Thr Trp Tyr Tyr  
195 200 205

Phe Asp Ser Ser Gly Tyr Met Leu Ala Asp Arg Trp Arg Lys His Thr  
210 215 220

Asp Gly Asn Trp Tyr Trp Phe Asp Asn Ser Gly Glu Met Ala Thr Gly  
225 230 235 240

Trp Lys Lys Ile Ala Asp Lys Trp Tyr Tyr Phe Asn Glu Glu Gly Ala  
245 250 255

Met Lys Thr Gly Trp Val Lys Tyr Lys Asp Thr Trp Tyr Tyr Leu Asp  
260 265 270

Ala Lys Glu Gly Ala Met Val Ser Asn Ala Phe Ile Gln Ser Ala Asp  
275 280 285

Gly Thr Gly Trp Tyr Tyr Leu Lys Pro Asp Gly Thr Leu Ala Asp Lys  
290 295 300

Pro Glu Phe Thr Val Glu Pro Asp Gly Leu Ile Thr Val Lys  
305 310 315

<210> 193

<211> 513

<212> PRT

<213> Streptococcus pneumoniae

<400> 193

Met Gly Thr Thr Gly Phe Thr Ile Ile Asp Leu Ile Ile Leu Ile Val  
1 5 10 15

Phe Gly Ala Val Ala Glu Thr Leu Ala Asn Gly Lys Phe Leu Ala Ala  
210 215 220

[illegible]

Ile Val Met Gly Ser Gly Phe Thr Ile Leu Ser Ser Tyr Ala Ser Ser  
245 250 255

Gln Asp Leu Val Gln Arg Phe Thr Thr Thr Gln Asn Ile Lys Lys Leu  
260 265 270

Asn Lys Met Leu Phe Thr Asn Gly Val Leu Ser Leu Ala Thr Ala Thr  
275 280 285

Val Phe Tyr Leu Ile Gly Thr Gly Leu Tyr Val Phe Tyr Gln Val Gln  
290 295 300

Asn Ala Asp Ser Ala Ala Ser Asn Ile Pro Gln Asp Gln Ile Phe Met  
305 310 315 320

Tyr Phe Ile Ala Tyr Gln Leu Pro Val Gly Ile Thr Gly Leu Ile Leu  
325 330 335

Ala Ala Ile Tyr Ala Ala Ser Gln Ser Thr Ile Ser Thr Gly Leu Asn  
340 345 350

Ser Val Ala Thr Ser Trp Thr Leu Asp Ile Gln Asp Val Ile Ser Lys  
355 360 365

Asn Met Ser Asp Asn Arg Arg Thr Lys Ile Ala Gln Phe Val Ser Leu  
370 375 380

Ala Val Gly Leu Phe Ser Ile Gly Val Ser Ile Val Met Ala His Ser  
385 390 395 400

Asp Ile Lys Ser Ala Tyr Glu Trp Phe Asn Ser Phe Met Gly Leu Val  
405 410 415

Leu Gly Leu Leu Gly Gly Val Phe Ile Leu Gly Phe Val Ser Lys Lys  
420 425 430

384

Ala Asn Lys Gln Gly Ala Tyr Ala Ala Leu Ile Val Ser Thr Ile Val  
435 440 445

Met Val Phe Ile Lys Tyr Phe Leu Pro Pro Thr Ala Val Ser Tyr Trp  
450 455 460

Ala Tyr Ser Leu Ile Ser Ile Ser Val Ser Val Val Ser Gly Tyr Ile  
465 470 475 480

Val Ser Val Leu Thr Gly Asn Lys Val Ser Ala Pro Lys Tyr Thr Thr  
485 490 495

Ile His Asp Ile Thr Glu Ile Lys Ala Asp Ser Ser Trp Glu Val Arg  
500 505 510

His

<210> 194

<211> 826

<212> PRT

<213> Streptococcus pneumoniae

<400> 194

Met Lys Ile Asn Lys Lys Tyr Leu Ala Gly Ser Val Ala Val Leu Ala  
1 5 10 15

Leu Ser Val Cys Ser Tyr Glu Leu Gly Arg His Gln Ala Gly Gln Asp  
20 25 30

Lys Lys Glu Ser Asn Arg Val Ala Tyr Ile Asp Gly Asp Gln Ala Gly  
35 40 45

Gln Lys Ala Glu Asn Leu Thr Pro Asp Glu Val Ser Lys Arg Glu Gly  
50 55 60



[illegible]

Thr Ser His Gly Asp His Tyr His Tyr Tyr Asn Gly Lys Val Pro Tyr  
85 90 95

Asp Ala Ile Ile Ser Glu Glu Leu Leu Met Lys Asp Pro Asn Tyr Gln  
100 105 110

Leu Lys Asp Ser Asp Ile Val Asn Glu Ile Lys Gly Gly Tyr Val Ile  
115 120 125

Lys Val Asp Gly Lys Tyr Tyr Val Tyr Leu Lys Asp Ala Ala His Ala  
130 135 140

Asp Asn Ile Arg Thr Lys Glu Glu Ile Lys Arg Gln Lys Gln Glu Arg  
145 150 155 160

Ser His Asn His Gly Ser Gly Ala Asn Asp His Ala Val Ala Ala Ala  
165 170 175

Arg Ala Gln Gly Arg Tyr Thr Thr Asp Asp Gly Tyr Ile Phe Asn Ala  
180 185 190

Ser Asp Ile Ile Glu Asp Thr Gly Asp Ala Tyr Ile Val Pro His Gly  
195 200 205

Asp His Tyr His Tyr Ile Pro Lys Asn Glu Leu Ser Ala Ser Glu Leu  
210 215 220

Ala Ala Ala Glu Ala Tyr Trp Asn Gly Lys Gln Gly Ser Arg Pro Ser  
225 230 235 240

Ser Ser Ser Ser Tyr Asn Ala Asn Pro Ala Gln Pro Arg Leu Ser Glu  
245 250 255

Asn His Asn Leu Thr Val Thr Pro Thr Tyr His Gln Asn Gln Gly Glu  
260 265 270

[illegible]

Leu Leu Asp Asn Lys Gly Arg Gln Val Asp Phe Glu Ala Leu Asp Asn  
465                      470                      475                      480

387

Leu Leu Glu Arg Leu Lys Asp Val Pro Ser Asp Lys Val Lys Leu Val  
485 490 495

Asp Asp Ile Leu Ala Phe Leu Ala Pro Ile Arg His Pro Glu Arg Leu  
500 505 510

Gly Lys Pro Asn Ala Gln Ile Thr Tyr Thr Asp Asp Glu Ile Gln Val  
515 520 525

Ala Lys Leu Ala Gly Lys Tyr Thr Thr Glu Asp Gly Tyr Ile Phe Asp  
530 535 540

Pro Arg Asp Ile Thr Ser Asp Glu Gly Asp Ala Tyr Val Thr Pro His  
545 550 555 560

Met Thr His Ser His Trp Ile Lys Lys Asp Ser Leu Ser Glu Ala Glu  
565 570 575

Arg Ala Ala Ala Gln Ala Tyr Ala Lys Glu Lys Gly Leu Thr Pro Pro  
580 585 590

Ser Thr Asp His Gln Asp Ser Gly Asn Thr Glu Ala Lys Gly Ala Glu  
595 600 605

Ala Ile Tyr Asn Arg Val Lys Ala Ala Lys Lys Val Pro Leu Asp Arg  
610 615 620

Met Pro Tyr Asn Leu Gln Tyr Thr Val Glu Val Lys Asn Gly Ser Leu  
625 630 635 640

Ile Ile Pro His Tyr Asp His Tyr His Asn Ile Lys Phe Glu Trp Phe  
645 650 655

Asp Glu Gly Leu Tyr Glu Ala Pro Lys Gly Tyr Thr Leu Glu Asp Leu  
660 665 670

Leu Ala Thr Val Lys Tyr Tyr Val Glu His Pro Asn Glu Arg Pro His  
675 680 685

00960737 043604

388

Ser Asp Asn Gly Phe Gly Asn Ala Ser Asp His Val Gln Arg Asn Lys  
690 695 700

Asn Gly Gln Ala Asp Thr Asn Gln Thr Glu Lys Pro Ser Glu Glu Lys  
705 710 715 720

Pro Gln Thr Glu Lys Pro Glu Glu Glu Thr Pro Arg Glu Glu Lys Pro  
725 730 735

Gln Ser Glu Lys Pro Glu Ser Pro Lys Pro Thr Glu Glu Pro Glu Glu  
740 745 750

Ser Pro Glu Glu Ser Glu Glu Pro Gln Val Glu Thr Glu Lys Val Glu  
755 760 765

Glu Lys Leu Arg Glu Ala Glu Asp Leu Leu Gly Lys Ile Gln Asp Pro  
770 775 780

Ile Ile Lys Ser Asn Ala Lys Glu Thr Leu Thr Gly Leu Lys Asn Asn  
785 790 795 800

Leu Leu Phe Gly Thr Gln Asp Asn Asn Thr Ile Met Ala Glu Ala Glu  
805 810 815

Lys Leu Leu Ala Leu Leu Lys Glu Ser Lys  
820 825

<210> 195

<211> 295

<212> PRT

<213> Streptococcus pneumoniae

<400> 195

Met Glu Gly Leu Val Arg Val His Leu Leu Pro Val Phe Gly Asp Tyr  
1 5 10 15

Lys Leu Ser Lys Leu Thr Thr Pro Ile Leu Gln Gln Gln Val Asn Lys  
 20 25 30

Trp Ala Asp Lys Ala Asn Lys Gly Glu Lys Gly Ala Phe Ala Asn Tyr  
 35 40 45

Ser Leu Leu His Asn Met Asn Lys Arg Ile Leu Lys Tyr Gly Val Ala  
 50 55 60

Ile Gln Val Ile Gln Tyr Asn Pro Ala Asn Asp Val Ile Val Pro Arg  
 65 70 75 80

Lys Gln Gln Lys Glu Lys Ala Ala Val Lys Tyr Leu Asp Asn Lys Glu  
 85 90 95

Leu Lys Gln Phe Leu Asp Tyr Leu Asp Ala Leu Asp Gln Ser Asn Tyr  
 100 105 110

Glu Asn Leu Phe Asp Val Val Leu Tyr Lys Thr Leu Leu Ala Thr Gly  
 115 120 125

Cys Arg Ile Ser Glu Ala Leu Ala Leu Glu Trp Ser Asp Ile Asp Leu  
 130 135 140

Glu Ser Gly Val Ile Ser Ile Asn Lys Thr Leu Asn Arg Tyr Gln Glu  
 145 150 155 160

Ile Asn Ser Pro Lys Ser Ser Ala Gly Tyr Arg Asp Ile Pro Ile Asp  
 165 170 175

Lys Ala Thr Leu Leu Leu Lys Gln Tyr Lys Asn Arg Gln Gln Ile  
 180 185 190

Gln Ser Trp Lys Leu Gly Arg Ser Glu Thr Val Val Phe Ser Val Phe  
 195 200 205

Thr Glu Lys Tyr Ala Tyr Ala Cys Asn Leu Arg Lys Arg Leu Asn Lys  
 210 215 220

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390

His Phe Asp Ala Ala Gly Val Thr Asn Val Ser Phe His Gly Phe Arg  
225 230 235 240

His Thr His Thr Thr Met Met Leu Tyr Ala Gln Val Ser Pro Lys Asp  
245 250 255

Val Gln Tyr Arg Leu Gly His Ser Asn Leu Met Ile Thr Glu Asn Thr  
260 265 270

Tyr Trp His Thr Asn Gln Glu Asn Ala Lys Lys Ala Val Ser Asn Tyr  
275 280 285

Glu Thr Ala Ile Asn Asn Leu  
290 295

<210> 196

<211> 2235

<212> DNA

<213> Streptococcus pneumoniae

<400> 196

atgaataaga aaaaaatgat tttaacaagt ctagccagcg tcgctatctt aggggctggt 60  
tttgttacgt ctcagcctac ttttgtaaga gcagaagaat ctccacaagt tgtcgaaaaa 120  
tcttcattag agaagaaata tgaggaagca aaagcaaaaag ctgatactgc caagaaagat 180  
tacgaaacgg ctaaaaagaa agcagaagac gctcagaaaa agtatgaaga tgatcagaag 240  
agaactgagg agaaagctcg aaaagaagca gaagcatctc aaaaattgaa tgatgtggcg 300  
cttggtgttc aaaatgcata taaagagtac cgagaagttc aaaatcaacg tagtaaatat 360  
aaatctgacg ctgaatatca gaaaaaatta acagaggtcg actctaaaat agagaaggct 420  
aggaaagagc aacaggactt gcaaaataaa tttaatgaag taagagcagt ttagtttcct 480  
gaaccaaagc ogttggctga gactaagaaa aaagcagaag aagctaaagc agaagaaaaa 540  
gtagctaaga gaaaatatga ttatgcaact ctaaaggtag cactagcgaa gaaagaagta 600  
gaggctaagg aacttgaaat tgaaaaactt caatatgaaa tttctacttt ggaacaagaa 660  
gttgctactg ctcaacatca agtagataat ttgaaaaaac ttcttgctgg tgcggtatcct 720  
gatgatggca cagaagttat agaagctaaa ttaaaaaaag gagaagctga gctaaacgct 780  
aaacaagctg agttagcaaa aaaacaaaca gaacttgaaa aacttcttga cagccttgat 840  
cctgaaggta agactcagga tgaattagat aaagaagcag aagaagctga gttggataaa 900

aaagctgatg aacttcaaaa taaagttgct gatttagaaa aagaaattag taaccttgaa 960  
 atattacttg gaggggctga tcctgaagat gatactgctg ctcttcaaaa taaattagct 1020  
 gctaaaaaag ctgagttagc aaaaaaacia acagaacttg aaaaacttct tgacagcctt 1080  
 gatcctgaag gtaagactca ggatgaatta gataaagaag cagaagaagc tgagttggat 1140  
 aaaaaagctg atgaacttca aaataaagtt gctgatttag aaaaagaaat tagtaacctt 1200  
 gaaatattac ttggaggggc tgattctgaa gatgatactg ctgctcttca aaataaatta 1260  
 gctactaaaa aagctgaatt ggaaaaaact caaaaagaat tagatgcagc tcttaatgag 1320  
 ttaggccctg atggagatga agaagaaact ccagcgccgg ctctcaacc agagcaacca 1380  
 gctcctgcac caaaaccaga gcaaccagct ccagctccaa aaccagagca accagctcct 1440  
 gcacccaaac cagagcaacc agctccagct ccaaaaccag agcaaccagc tccagctcca 1500  
 aaaccagagc aaccagctaa gccggagaaa ccagctgaag agcctactca accagaaaaa 1560  
 ccagccactc caaaaacagg ctggaaacia gaaaacggta tgtgggtattt ctacaatact 1620  
 gatggttcaa tggcaatagg ttggctccaa aacaacggtt catggtacta cctaaacgct 1680  
 aacggcgcta tggcaacagg ttgggtgaaa gatggagata cctgggtacta tcttgaagca 1740  
 tcaggtgcta tgaaagcaag ccaatgggtc aaagtatcag ataaatggta ctatgtcaac 1800  
 agcaatggcg ctatggcgac aggtgggtc caatacaatg gctcatggta ctacctcaac 1860  
 gctaattggtg atatggcgac aggatgggtc caatacaacg gttcatggta ttacctcaac 1920  
 gctaattggtg atatggcgac aggatgggtc aaagtcaacg gttcatggta ctacctcaac 1980  
 gtaacgggtg ctatggctac aggttgggtc aaagtcaacg gttcatggta ctacctcaac 2040  
 gtaacgggtt caatggcaac aggttgggtg aaagtggag atacctggta ctatcttgaa 2100  
 gcatcaggtg ctatgaaagc aagccaatgg ttcaaagtat cagataaatg gtactatgtc 2160  
 aatggcttag gtgcccttgc agtcaacaca actgtagatg gctataaagt caatgccaat 2220  
 ggtgaatggg ttttaa 2235

<210> 197

<211> 2082

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 197

atgtttgcat caaaaagcga aaaaaagta cattattcaa ttcgtaaatt tagtggttga 60  
 gtagctagt tagttgttgc cagtcttgtt atgggaagtg tggttcatgc gacagagAAC 120  
 gagggagcta ccaagtagc cacttcttct aatagggcaa atgaaagtca ggcagaacia 180  
 ggagaacia ctaaaaaact cgattcagaa cgagataagg caaggaaaga ggtagaggaa 240  
 tatgtaaaaa aaatagtggg tgagagctat gcaaaatcaa ctaaaaagcg acatacaatt 300  
 actgtagctc tagttaacga gttgaacia attaagaacg agtatttgaa taaaatagtt 360  
 gaatcaacct cagaaagcca actacagata ctgatgatgg agagtcgac aaaagtagat 420

gaagctgtgt ctaagtttga aaaggactca tcttcttctgt caagttcaga ctcttccact 480  
 aaaccggaag cttcagatac agcgaagcca aacaagccga cagaaccagg agaaaaggta 540  
 gcagaagcta agaagaaggt tgaagaagct gagaaaaaag ccaaggatca aaaagaagaa 600  
 gatcgtcgta actacccaac cattacttac aaaacgcttg aacttgaaat tgctgagtcc 660  
 gatgtggaag ttaaaaaagc ggagcttgaa ctagtaaaaag tgaaagctaa cgaacctcga 720  
 gacgagcaaa aaattaagca agcagaagcg gaagttgaga gtaaacaagc tgaggctaca 780  
 aggttaaaaa aaatcaagac agatcgtgaa gaagcagaag aagaagctaa acgaagagca 840  
 gatgctaaaag agcaaggtaa accaaagggg cgggcaaaaac gaggagttcc tggagagcta 900  
 gcaacacctg ataaaaaaga aaatgatgag aagtcttcag attctagcgt aggtgaagaa 960  
 actcttccaa gcccatccct gaaaccagaa aaaaaggtag cagaagctga gaagaagggt 1020  
 gaagaagcta agaaaaaagc cgaggatcaa aaagaagaag atcgccgtaa ctacccaacc 1080  
 aatacttaca aaacgcttga acttgaaatt gctgagtccg atgtggaagt taaaaaagcg 1140  
 gagcttgaac tagtaaaaga ggaagctaag gaacctcgaa acgaggaaaa agttaagcaa 1200  
 gcaaaaagcgg aagttgagag taaaaaagct gaggctacaa ggtagaaaa aatcaagaca 1260  
 gatcgtaaaa aagcagaaga agaagctaaa cgaaaagcag cagaagaaga taaagttaaa 1320  
 gaaaaaccag ctgaacaacc acaaccagcg cgggctccaa aagcagaaaa accagctcca 1380  
 gctccaaaac cagagaatcc agctgaacaa ccaaaagcag aaaaaccagc tgatcaacaa 1440  
 gctgaagaag actatgctcg tagatcagaa gaagaatata atcgcttgac tcaacagcaa 1500  
 ccgcaaaaaa ctgaaaaacc agcacaacca tctactccaa aaacaggctg gaaacaagaa 1560  
 aacggatatgt ggtacttcta caatactgat ggttcaatgg cgacaggatg gctccaaaac 1620  
 aatggctcat ggtactacct caacagcaat ggcgctatgg cgacaggatg gctccaaaac 1680  
 aatggttcat ggtactatct aaacgcta at ggttcaatgg caacaggatg gctccaaaac 1740  
 aatggttcat ggtactacct aaacgcta at ggttcaatgg cgacaggatg gctccaatac 1800  
 aatggctcat ggtactacct aaacgcta at ggttcaatgg cgacaggatg gctccaatac 1860  
 aatggctcat ggtactacct aaacgcta at ggtgatatgg cgacagggtg ggtgaaagat 1920  
 ggagatacct ggtactatct tgaagcatca ggtgctatga aagcaagcca atgggttcaaa 1980  
 gtatcagata aatgggtacta tgtcaatggc tcagggtgcc ttgcagtcaa cacaactgta 2040  
 gatggctatg gagtcaatgc caatggtgaa tgggtaaaact aa 2082

<210> 198

<211> 390

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 198

atggtaaaaa gacgtataag gagagggacg agagaacctg aaaaagttgt tggtcctgag 60  
 caatcatcta ttccttcgta tcctgtatct gttacatcta accaaggaac agatgtagca 120



gtagaaccag ctaaagcagt tgctccaaca acagactgga aacaagaaaa tggatatgtgg 180  
 tatttttata atactgatgg ttccatggca acagggtggg tacaagttaa tagttcatgg 240  
 tactacctca acagcaacgg ttctatgaaa gtcaatcaat ggttccaagt tggtggtaaa 300  
 tggattatg taaatacatc gggtagtga gcggtcaata caagtataga tggctataga 360  
 gtcaatgata atggtgaatg ggtgcgtaa 390

<210> 199

<211> 693

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 199

ctgaatacaa gttttgttca tgctgctgat gggattcaat atgtcagaga tgataactaga 60  
 gataaagaag aggaataga gtatgatgac gctgacaatg gggatattat tgtaaaagta 120  
 gcgactaaac ctaaggtagt aaccaagaaa atttcaagta cggaattcg ttatgaaaaa 180  
 gatgaaacaa aagaccgtag tgaaaatcct gttacaattg atggagagga tggctatgta 240  
 actacgacaa ggacctacga tgtaaatcca gagactggtt atgttaccga acaggttact 300  
 gttgatagaa aagaagccac ggatacagtt atcaaagttc cagctaaaag caagggtgaa 360  
 gaagttcttg ttccatttgc tactaaatat gaagcagaca atgacctttc tgcaggacag 420  
 gagcaagaga ttactctagg aaagaatggg aaaacagtta caacgataac ttataatgta 480  
 gatggaaaga gtggacaagt aactgagagt actttaagtc aaaaaaaga ctctcaaaca 540  
 agagttgtta aaaaaagaac caagcccaa gttcttgtcc aagaaattcc aatcgaaaca 600  
 gaatatctcg atggcccaac tcttgataaa agtcaagaag tagaagaagt aggagaaatt 660  
 ggtaaattac tcttactaca atctatactg tag 693

<210> 200

<211> 1023

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 200

atgaagcttt tgaaaaaat gatgcaaact gcactagcca catttttctt cggtttgta 60  
 gcgacaaata cagtatttgc agatgattct gaaggatggc agtttgtcca agaaaatgg 120  
 agaacctact aaaaaagg ggtactaaaa gaaacctact ggagagtgat agatgggaag 180  
 tactattatt ttgatccttt atccggagag atggttgctg gctggcaata tatacctgct 240  
 ccacacaagg gggttacgat tggtccttct ccaagaatag agattgctct tagaccagat 300

tggttttatt ttggtcaaga tgggtgtatta caagaatttg ttggcaagca agtttttagaa 360  
 gcaaaaaactg ctacgaatac caacaaacat catggggaag aatatgatag ccaagcagag 420  
 aaacgagtct attatatttga agatcagcgt agttatcata ctttaaaaaac tggttggatt 480  
 tatgaagagg gtcattggta ttatttacag aaggatgggtg gctttgattc gcgcatcaac 540  
 agattgacgg ttggagagct agcacgtggt tgggttaagg attaccctct tacgtatgat 600  
 gaagagaagc taaaagcagc tccatggtac tatctaaatc cagcaactgg cattatgcaa 660  
 acaggttggc aatatctagg taatagatgg tactacctcc attcgtcagg agctatggca 720  
 actggctggt ataaggaagg ctcaacttgg tactatctag atgctgaaaa tggtgatatg 780  
 agaactggct ggcaaaacct tgggaacaaa tgggtactatc tccgttcacg aggagctatg 840  
 gcaactgggt ggtatcagga aagttcgact tgggtactatc taaatgcaag taatggagat 900  
 atgaaaacag gctggttcca agtcaatggt aactgggtact atgcctatga ttcagggtgct 960  
 ttagctgtta ataccacagt aggtggttac tacttaaact ataatggtga atgggttaag 1020  
 taa 1023

<210> 201

<211> 546

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 201

ttggctggta gatatgggtc tgctgttcag tgtacagaag tgactgcctc aaacctttca 60  
 acagttaaaa ctaaagctac gggtgtagaa aaaccactga aagatttttag agcgtctacg 120  
 tctgatcagt ctggttgggt ggaatctaata ggtaaatggt atttctatga gtctgggtgat 180  
 gtgaagacag gttgggtgaa aacagatggt aaatggtact atttgaatga cttagggtgtc 240  
 atgcagactg gatttgtaaa attttctggt agctggtatt acttgagcaa ttcagggtgct 300  
 atgtttacag gctggggaac agatggtagc agatggttct actttgacgg ctcaggagct 360  
 atgaagacag gctggtacaa ggaaaatggc acttggtatt accttgacga agcagggtatc 420  
 atgaagacag gttggtttta agtcggacca cactgggtact atgcctacgg ttcaggagct 480  
 ttggctgtga gcacaacaac accagatggt taccgtgtaa atggtaatgg tgaatgggta 540  
 aactag 546

&lt;210&gt; 202

&lt;211&gt; 999

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 202

atgaaaattt tgaaaaaac tatgcaagtt ggactgacag ttttttctt tggtttgcta 60  
 gggaccagta cagtatttgc agatgattct gaaggatggc agtttgtcca agaaaacgga 120  
 agaacctact acaaaaaggg ggacctcaaa gaaacctact ggcgagtgat tgatggtaag 180  
 tactattatt ttgattctct atctggagag atgggtgtcg gctggcaata tatcccgttt 240  
 ccatctaaag gtagtacaat tggtccttac ccaaaggta tcagattaga aggttttcca 300  
 aagtcagagt ggtactactt cgataaaaat ggagtgtac aagagtttgt tggttggaaa 360  
 acattagaga ttaaaactaa agacagtgtt ggaagaaagt acggggaaaa acgtgaagat 420  
 tcagaagata aagaagagaa gcgttattat acgaactatt actttaatca aaatcattct 480  
 ttagagacag gttggcttta tgatcagtct aactgggtatt atctagctaa gacggaaatt 540  
 aatggagaaa actacottgg tggtgaaaga cgtgcggggg ggataaacga tgattcgact 600  
 tggactacc tagatccaac aactgggtatt atgcaaacag gttggcaata tctaggtaat 660  
 aagtgggtact acctccgttc ctcaggagca atggccactg gctgggtatca ggaagggtacc 720  
 acttgggtatt atttagacca ccaaaggc gatatgaaaa caggttggca aaaccttggg 780  
 aacaaatggg actatctccg ttcacagga gctatggcaa ctggttggt tcaagatggg 840  
 tcaacttggg actacctaaa tgcaggtaat ggagacatga agacaggttg gttccagggtc 900  
 aatggcaact ggtactatgc ttatagctca ggtgctttgg cagtgaatac gaccgtagat 960  
 ggctattctg tcaactataa tggcgaatgg gttcggtaa 999

&lt;210&gt; 203

&lt;211&gt; 1884

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 203

atgaaaaaga aattaactag tttagcactt gtaggcgctt ttttaggttt gtcattggtat 60  
 gggaatgttc aggctcaaga aagttcagga aataaaatcc actttatcaa tgttcaagaa 120  
 ggtggcagtg atgcgattat tcttgaaagc aatggacatt ttgccatggg ggatacagga 180  
 gaagattatg atttccaga tggaaagtgt tctcgtatc catggagaga aggaattgaa 240  
 acgtcttata agcatgttct aacagaccgt gtctttcgtc gtttgaagga attgggtgtc 300  
 caaaaacttg attttatttt ggtgacccat acccacagtg atcatattgg aaatgttgat 360  
 gaattactgt ctacctatcc agttgaccga gtctatctta agaaatatag tgatagtcgt 420

attactaatt ctgaacgtct atgggataat ctgtatggct atgataaggt ttacagact 480  
 gctgcagaaa aaggtgtttc agttattcaa aatatcacac aaggggatgc tcattttcag 540  
 tttggggaca tggatattca gctctataat tatgaaaatg aaactgattc atcgggtgaa 600  
 ttaaagaaaa tttgggatga caattccaat tccttgatta gcgtgggtgaa agtcaatggc 660  
 aagaaaattt accttggggg cgatttagat aatgttcatt gagcagaaga caagtatggc 720  
 cctctcattg gaaaagttga tttgatgaag tttaatcatc accatgatac caacaaatca 780  
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<210> 204

<211> 957

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 204

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<210> 205

<211> 1542

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 205

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<210> 206

<211> 2481

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 206

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<210> 207

<211> 888

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 207

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<210> 208

<211> 624

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 208

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<210> 209

<211> 6702

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 209

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<210> 210

<211> 1476

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 210

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<210> 211

<211> 1413

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 211

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<210> 212

<211> 1008

<212> DNA

<213> Streptococcus pneumoniae

<400> 212

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<210> 213

<211> 1332

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 213

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&lt;210&gt; 214

&lt;211&gt; 1428

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 214

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&lt;210&gt; 215

&lt;211&gt; 1827

&lt;212&gt; DNA

&lt;213&gt; Streptococcus pneumoniae

&lt;400&gt; 215

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09369797.013604



&lt;210&gt; 216

&lt;211&gt; 705

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 216

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&lt;210&gt; 217

&lt;211&gt; 1008

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 217

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<210> 218

<211> 411

<212> DNA

<213> Streptococcus pneumoniae

<400> 218

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<210> 219

<211> 3300

<212> DNA

<213> Streptococcus pneumoniae

<400> 219

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<210> 220

<211> 3651

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 220

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&lt;210&gt; 221

&lt;211&gt; 648

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 221

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&lt;210&gt; 222

&lt;211&gt; 1224

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 222

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<210> 223

<211> 570

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 223

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<210> 224

<211> 936

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 224

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<210> 225

<211> 1977

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 225

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 ttccttgga acaaggcttc tggatgaat gtggaatatg cttcagaccc ttattggggc 1920  
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<210> 226

<211> 867

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 226

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867

<210> 227

<211> 837

<212> DNA

<213> Streptococcus pneumoniae

<400> 227

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 cgggattcca aaatgtggac tctgcctttg ttccaatata actacgcagg ccaatatttc 720  
 aacgactacg gaccaagctt tgcctcttac gtggctcgga ttatcagtat caccattgtc 780  
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<210> 228

<211> 1044

<212> DNA

<213> Streptococcus pneumoniae

<400> 228

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 catttccaaa ttgtgaagaa atttaactat gcttttcttt caccataat gcagggtgtgg 300  
 catcagaacc gggcagaagt gaccttcttt aatcctaatt attatggaat tatttgttgt 360  
 ttctgtatta tgattgcttt ctatctgttt acaacgacca agttgaattg gttgaaagta 420

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 cctgttcgct tgatgatgga tatgagtcag gagtcgggga aacgtccgat tatcggcctt 900  
 tatctatctt tccttacagt ggttgctgtg cacggaattt ttgacttggc tctcttctgg 960  
 attcagtcag gctttatttt cttgctagtt atgtgcagta ttccattgga gcatcgaatg 1020  
 ttggtatcgg acatgacgga ttaa 1044

<210> 229

<211> 1299

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 229

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 ttgtttcttga ttatgggaca attgccgttc gaaggattaa ataagagcat tgctagtgtt 180  
 tttggagcta attggacaga gccgtttatg caagtatatt caggaacttt tgctattatg 240  
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 ccgattgtca tgaatccagt tatgtttgta cctttcatc ttgttctgt acttgacgt 1080  
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ccttggagta caccagctat tttatcagga tttttggtgg gtggatggca aggagttatt 1200  
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 gatcgtttag cttaccaaaa tgaaatcaaa caatcttag 1299

<210> 230

<211> 303

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 230

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 caagcttttag attctactac agtaaatttg ctagagacag atccttatat cacctcagga 180  
 cgccatctgg tagtaccocaa ggacgcgcgc aatcaaaagg tgacagccag tctgccagtg 240  
 gcgcataaac tggagagttt gcagagagat atccttgctt gcaggcgggt atggatgtct 300  
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<210> 231

<211> 717

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 231

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 ggaacagtcg gtagtaagtc tcaaggagct gccagaaga aagcagaagt ggtcaataaa 180  
 ggtgattact acagcattca agggaaatac gatgaaatca tcgtagccaa caaacactat 240  
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 ctcatcaaaag cgatgcaaga ggcagggttc cctattagtg atcattacag tggttttaga 360  
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 gctgaccgtt actctgcccg tcttggtat agcgaacacc agacaggctt ggcctttgat 480  
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&lt;210&gt; 232

&lt;211&gt; 1269

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 232

atgcgtaa at tcttaattat tttgttgcta ccaagttttt tgaccatttc aaaagtcggt 60  
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 tttggtattt attttagaga aaaattaagt tctcccatgg tttatggaga gggtcctggt 180  
 tatgcgaatg aagattttagt agtggaatct gggaaattga ctcccaaac aagttttcaa 240  
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 aaagtatggt tagaatctga ctttaaaactg tacaatagtc cttatgattt aaaagaagtg 420  
 aaatcatcct tatcagctta ttgcgaagta tcaatcgaca agaccatggt tgtagaagga 480  
 agagaatttc tacatattga tcaggctgga tgggtagcta aagaatcaac ttctgaagaa 540  
 gataatcgga tgagtaaagt tcaagaaatg ttatctgaaa aatatcagaa agattctttc 600  
 tctatttatg ttaagcaact gactactgga aaagaagctg gtatcaatca agatgaaaag 660  
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 ttactaaga attctgatta tgatacgatt tctaagatag ccaaggatgt ttatgaggtt 1260  
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&lt;210&gt; 233

&lt;211&gt; 1959

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 233

atgaaaaaac aaaataatgg ttttaattaaa aatccttttc tatggttatt atttatcttt 60  
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atcaactata ctgagttggt acaagaaatt accgatggta atgtaaaaga attaacttac 180  
 caaccaaagt gtagtggtat cgaagtttct ggtgtctata aaaatcctaa aacaagtaaa 240  
 gaagaaacag gtattcagtt tttcacgcca tctgttacta aggtagagaa atttaccagc 300  
 actattcttc ctgcagatac taccgtatca gaattgcaaa aacttgctac tgaccataaa 360  
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 gctctttacg aaacaggaaa gatgcctgaa gcagtagaag aggaatctca tgcactatcc 1920  
 tatgatgaag taaagtcaaa aatgaatgac gaaaaataa 1959

&lt;210&gt; 234

&lt;211&gt; 1278

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 234

atgagggaac cagatttttt aaatcatttt ctcaagaagg gatatttcaa aaagcatgct 60  
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 attgaatcag attggaaga aaaggaatta aggaagttgg ctgctgaagc agagcttcct 240  
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 gctgatgatc aggtggaaac gatttttatg cgcttgattc gaggaactcg cttgcgctat 420  
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 aatcattatt ttcgaaatcg tattcgaaat tcttacttac cagaattgga aaaagaaaat 600  
 cctcgattta gggatgcaat cttaggcatt ggcaatgaaa ttttagatta tgatttggca 660  
 atagctgaat tatctaacia tattaatgtg gaagatttac agcagttatt ttcttactct 720  
 gagtctacac aaagagtttt acttcaaact tatctgaatc gttttccaga tttgaatctt 780  
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 aaaaatgggc atagaaaaaa actcagacgt ttattttattg atttgaaaat ccctatggaa 1140  
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 gaaaaaatag ataggtaa 1278

&lt;210&gt; 235

&lt;211&gt; 1692

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 235

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attgagggca acagccaaac gaccatcagc cagactagcc actttattca gtcttatatc 180  
 aaaaaactag aaaccacctc gactgggttg acccagcaga cggatgttct ggcctatgct 240  
 gagaatccca gtcaagacaa ggtcgagggga atccgagatt tgtttttgac catcttgaag 300  
 tcagataagg acttgaaaac tgttgtgctg gtgaccaaact ctggtcaggt catttctaca 360  
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 gccattcatc agggagctat gcctgttttg actccagctc gtaaactcaga tagtcagtgg 480  
 gtcatttctg tcaactcaaga acttgttgat gcaaagggag ccaatcttgg tgtgcttcgt 540  
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 ggagttggtc ttcaaatgt cgatcaacgg ctcaaacttc attttggagc caattacat 1620  
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 gaaactagct aa 1692

<210> 236

<211> 1692

<212> DNA

<213> Streptococcus pneumoniae

<400> 236

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 attgagggca acagccaaac gaccatcagc cagactagcc actttattca gtcttatatc 180



aaaaaactag aaaccacctc gactggtttg acccagcaga cggatgttct ggcctatgct 240  
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 tcagataagg acttgaaaac tgttggtgctg gtgaccaaact ctgggtcaggt cattttctaca 360  
 gatgacagtg tgcagatgaa aaacttcctct gatatgatgg ctgaggattg gtacaaaaag 420  
 gccattcatc agggagctat gcctgttttg actccagctc gtaaatcaga tagtcagtgg 480  
 gtcattttctg tcaactcaaga acttggttgat gcaaagggag ccaatcttgg tgtgcttcgt 540  
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 ggctttgcct tcattatcaa tgaaaacat gaatttgtct accatcctca acacacagtt 660  
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 ggagttggtc ttcaaaatgt cgatcaacgg ctcaaacttc attttgagc caattaccat 1620  
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 gaaactagct aa 1692

<210> 237

<211> 1140

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 237

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 aatgccataa gcttgaatgc tttaagtggg ttatccttct taaacatgtt gagcttgggtg 180  
 tcgggggaatg ccctaaaaaa cttttcgatt ttgcccctag gagttagtc ctatatcacc 240

gcttctattg ttgtccaact ctgcaaatg gatattttac ccaagtttgt agagtggggt 300  
 aaacaagggg aagtaggtcg aagaaaattg aatcaagcta ctggttatat tgctctagtt 360  
 ctgctttttg tgcaatctat cgggattaca gctgggttta ataccttggc tggagctcaa 420  
 ttgattaaaa ctgctttaac tccacaagtt tttctgacga ttggtatcat cttaacagct 480  
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<210> 238

<211> 1338

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 238

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09593 01501

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<210> 239

<211> 858

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 239

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 acattggata gaaaataa 858

&lt;210&gt; 240

&lt;211&gt; 1212

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 240

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&lt;210&gt; 241

&lt;211&gt; 981

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 241

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tctgttttgg ttgcttttctt tttcgcccta tttagtagcc aattcagcaa taatgtggga 240  
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<210> 242

<211> 1281

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 242

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<210> 243

<211> 1263

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 243

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 taa 1263

&lt;210&gt; 244

&lt;211&gt; 2355

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 244

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<210> 245

<211> 1542

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 245

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<210> 246

<211> 1455

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 246

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 cgcaaaaaca tttag 1542

&lt;210&gt; 247

&lt;211&gt; 462

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 247

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&lt;210&gt; 248

&lt;211&gt; 855

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 248

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&lt;210&gt; 249

&lt;211&gt; 1185

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 249

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&lt;210&gt; 250

&lt;211&gt; 1347

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 250

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 acctttgttg gtttcttagt tgtatctggg ggtgcaggaa ttgtacaaaa ttctttaaat 180  
 ccatttggtg ccatgtttga gcatgctttt catttatctg gcgttgtgcc gaataatgaa 240

gcaattgtag ctgtagcttt aacaacatat ggctcagcta ctgcaatgat tatgtttgca 300  
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 aaaaagccat ctgcaacgga ggaataa 1347

<210> 251

<211> 1002

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 251

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 tttttcctat ctttttacia gaaaaataaa caaatacggg tttactctgg cattttgctc 240  
 ttactatogo tcatattact attattcgga acagataaaa ccttttcttc tgcacaaat 300  
 aagactaaaa ccttaaaatt agtaacttg aacgtcgcta atcaaataga agcacaacat 360  
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<210> 253

<211> 1380

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 253

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 gccaaaggctt ctcaggagac ctttaaaaat atcaccaata gcttctccat gcaaatacaat 180  
 cgtcgcgtca accaaggaac gcctcgtggt gctgggaata tcaaggggga agacatcaaa 240  
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 gccaaagcgtt ttggaagtag cttgatgatt acagggtgtca atgactcctc taaagaagac 420  
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 gttaaactgg actctaatat ctacgatgca gataatgaaa aaggagccaa ggaaacagtt 600  
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 acagaagaca cagccattta tggggacgca accttctttg taacagcaga caagaacttg 780  
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<210> 254

<211> 618

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 254

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tcatcgattg tcggtggggt tgggagtttg attttctgta tttgggctta tcaggctggg 120  
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 cctctcttta tctttttaca gatttttacag actgtcgtcc ctatcattcc aggggccttg 240  
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 ggcacgtga ttggctgtgc cattatcttt tatctagtgc gcctatacgg agctgccttt 360  
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 aatcgttttg accgcttctt tatttttatg atgatttggc ccattagccc agctgacttt 480  
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<210> 255

<211> 1200

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 255

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 ctccaagggt cttctatggc taaaaataat aaagtggcag tagtgacaac agtgccatct 180  
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<210> 256

<211> 714

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 256

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aagaatttcc aatcctactc tgtgattgtg gtacgaagtc aagagaagaa agatgccttg 180  
tatgaattgg tacctcaaga agccattcgc cagtctgctg ttttccttct ctttgtcgga 240  
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gaggaagaat accaagaaca gtcaactgag gcaatccaag cttatgaccg tgttcaggct 600  
gactatgctg gggcgcgtgc gaccacaagc tggagtcagc gcctagcaga acagtttggt 660  
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<210> 257

<211> 606

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 257

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&lt;210&gt; 258

&lt;211&gt; 843

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 258

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 aaggctaagg atggagaaga agcctatcgt gcagtgttag aagccttgaa ggctgggttat 120  
 cgtcatattg atacggcggc gatttatcag aatgaagaaa gtgttgggtca agcaatcaaa 180  
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 ttggattttgt atttgattca ttggccgaac ccaaaaccgc tcagagaaaa tgacgcatgg 360  
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 gaaaccttaa aaacgattgc tgttcaatcg ggtgctccac gagttgatga tgtggatttc 840  
 tag 843

&lt;210&gt; 259

&lt;211&gt; 801

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 259

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atgcgaacag atagtctcat gttcttcggc tttcagagtgt cccaatggct gtcagttgtc 720  
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<210> 260

<211> 390

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 260

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gagattgtga ttgatataac agaagaataa 390

<210> 261

<211> 618

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 261

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aatcgagtct atctaaaacc agaaaccatt caatacaatt ttcatatctt gatgaattat 180  
ctgaccaatc ctttttagtca ggtcttacag atgcctgatt ttcgttcgtc agcagctggg 240  
ctgcaccatt tcgcagtggt caagaatctc tttcatttgg ttcagctagt agctctagt 300  
aactgocaa gtttctatgt ctttgtcaat aggattgtga aaaaggactt tttgtctctt 360  
tatcgaaaaa gtctcctggc tctagtagtc ttacctgtga tgattggact tgggggagtt 420  
ttgattgggt ttgaccaatt ctttactctt ttccatcaaa ttctctttgt gggagatgat 480  
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<210> 262
<211> 1914
<212> DNA
<213> Streptococcus pneumoniae
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 atcggccaag ccagccgat ttcgggagta aaccagcag atatttctat tttgatggtg 1860  
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<210> 263

<211> 684

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 263

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 cctgccatcg attttttgat ggcaagtttg gattggacac ccaaggattt ggaccgaatc 180  
 gtggtagctg aagggccggg tagctataca ggcttgcgaa ttgcggtagc aactgctaag 240  
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 ccccatcaac aagaaggttt gtttgtcccc ttgatggatg cgcgtcgcaa taatgtttat 360  
 gcaggatttt atgaaaatgc caaacctgtc atggcagaag cgcacctatc ttttgaagag 420  
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 gttgagcaga ttcaaaaaca cttgccagg actgattaca aagaaacatt gcccaatgca 540  
 gctaattctag ctcttttggc ctgggacaag gaagcagact ccttgcatga ttttgtgccg 600  
 aattacctca aacgagtcga ggctgaggaa aactggctca agaaccatac cgagtctggc 660  
 gagtcttaca ttaaacgcct atga 684

<210> 264

<211> 438

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 264

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 caagaccaga cttggtatgc attggcttat gatggggcag aagtgattgg atttctagct 180  
 gtgcaggaga atctttttga agcagaagtc ctgcaaactg ctgtcaaagg agcttatcag 240  
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 gaagtcagac agtcaaatca acgagcgcaa gcattttaca agaaagaaaa gatgacagtt 360

00769759-01504

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gaaatagatg aaggatag 438

<210> 265

<211> 558

<212> DNA

<213> Streptococcus pneumoniae

<400> 265

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ttggcagaaa cagaaccctt tgattttatc ttgcttgata tcatgttacc acaattagat 180  
ggcatggaag tttgtaagcg gctgagagcc aaaggcgtca aaactccaat tatgatgggt 240  
tctgcgaaaa gtgatgaatt tgataagggtt ttggccttgg aattaggggc tgatgactac 300  
ctgaccaagc ctttttagccc tagagaattg ctggcgcgtg tcaaggctgt cctcaggcga 360  
actaaaggag aacaagaagg agatgattca gataatatcg ctgacgattc ttggctatct 420  
gggaccttga aagtataccc tgagcgtcat gaagtctaca aggcgaataa gttactgagt 480  
ttgaccccaa aagaatttga aagcgataaa aatccgtttt ttgaagtttt caaagtttcg 540  
aaagtaaccg cccaataa 558

<210> 266

<211> 1437

<212> DNA

<213> Streptococcus pneumoniae

<400> 266

atgactactt ttaaagatgg atttttatgg ggtggtgctg ttgctgctca tcaacttgaa 60  
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catggagtag ctcgtagaat tactttggga gtttttagagg gtaaataatta tccaaatcat 180  
gaggcgatag atttttatca ccgttataaa gaagatatag cactttttgc tgaaatggga 240  
ttcaagtgtc tccgtacctc tattgcatgg acacgtatct ttccaaaagg tgatgagtta 300  
gagccgaatg aagaaggatt acagttttat gataatcttt ttgatgaatg cttaaagaat 360  
ggtattgaac ctgtcatcac totatctcat ttgaaatgc cttatcactt agtgaccgaa 420  
tatggtgggt ggaaaaatag gaaattgatt gattttcttg ctcgttttgc agaagtcgta 480  
tttaaacgtt acaaagataa ggttaaatat tggatgactt tcaatgaaat caataatcaa 540  
gcgaattatc aggaagattt tgcaccattt actaactcag gtattgtata tgaggaaggt 600

gataatagag aagcaattat gtatcaagca gcacattacg aattagttgc ttctgcacga 660  
 gctgtaaaaa ttggtcatga gattaatcca gattttcaaa taggttgatgattg 720  
 tgtccaattt atccagttac ttgcaatcct aaggatatct taatggcaat gaaagctatg 780  
 cagaagcgtt attattttgc tgatgtgcat gtttttaggta aatatcctga gcatattttc 840  
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 cttggtggga ctgtagatta cattggtttc agttactata tgtcctttgc tatcgactct 960  
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 ggctttattt atgtagataa agatgataat gggaaggga gttataatcg tccccgaaa 1380  
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<210> 267

<211> 1347

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 267

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 aaacttgctc agtttaaagt agtacgtgct atcacggctg caggatggc tgctgtacca 120  
 ttactattg taggatcaat gtttttggtt ttcagtattt tgccacaagc tttctcattt 180  
 tggccaattg tggcagatat tttctctgct tcatttgata aattcacatc actttacatg 240  
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 ttgcttgctc tgatggcttt tgatcatgaca gtaccgcaaa tcatttttga tgggtggaatg 420  
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 aatgtagtcg cacgttttgg gacaacaggc atttttaccg caatcattat ggcaattgtg 540  
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 ccagtaggga ttggagcttt cttagggaca gcagatcttc gagctgtatt agttgctcta 1260  
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 ttggtgaaaag aagagcaagg tatctaa 1347

<210> 268

<211> 1974

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 268

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 cttttttagtag gaggctatgt ttttttattt aagaaactga gagtgcatta tacaaggagt 180  
 gatgtagaac agatacagta tgtaaacac caagcggaag aaagtttgac agctctattg 240  
 gaacagatgc ctgtagggtg tatgaaattg aatttatctt ctggagaggt tgagtgggtt 300  
 aatccctatg ctgaattgat tttagaccaag gaagatggtg attttgattt agaagctgtt 360  
 caaacgatta tcaaggcttc agtaggaaat ccgctactt atgccaagct tggtgagaag 420  
 cgttatgctg ttcatatgga tgcttcttcc ggtgttttgt atttttaga tgtatccagg 480  
 gaacaagcca taacagatga attggttaaca agtagaccag tgattgggat tgtctctgtg 540  
 gataattatg atgatttgga ggatgaaact tctgagtcag atattagtca aatcaatagt 600  
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 agtatggatc gatttttatct atttactgac tacacgggtgc ttgagggcct gatgaatgat 720  
 aaattttctg ttattgatgc tttcagagaa gagtcgaaac agagacagtt gcccttgacc 780  
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 ggccacttta atttggcagc agctcaaatt aaagatgtaa cttgttcaga agcaggtgaa 1920  
 aaactgacag aaattgtatt aaatgaaatg aaggaaaagg agaaagaaga atga 1974

<210> 269

<211> 1416

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 269

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 ttacttgccg tcctttttata tcaggttccc ctagtggtta cctctatttt gactttaaaa 120  
 gaagtagccc tgctacagtc agggctgata gttgctggcc tttcaattgt ggttctggct 180  
 ctattttatta tgggagctcg taaaaccaag ttagctagtt ttaatttttc tttttttaga 240  
 gctaaagatt tggcacgttt gggcttgagt tatctagtta ttgtcgggtc aaatatactt 300  
 ggttccattt tattgcaact gtcaaatgag acgacaacag ctaaccagtc tcagattaat 360  
 gatatggttc aaaatagttc gttgatttcc agtttcttct tgctagcctt gcttgcctcg 420  
 atttgtgagg aaatcttgtg tcgtgggatt gttcctaaaa agattttccg aggcaaggag 480  
 aacttgggat ttgtagtcgg tacgattgtg tttgctttat tgcacaaacc aagtaattta 540  
 ccttctttat tgatttatgg aggtatgtcg acagttctat cttggacagc ctacaagacc 600  
 caacgttttg aaatgtcgat cttgcttcac atgattgtta atgggattgc tttctgtttg 660  
 ttggctcttg tggtgattat gagtcggaca ttaggaattt ctgtttaaat gaaagagaaa 720  
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 atgtcgatct tgcttcacat gattgttaat gggattgctt tctgtttgtt ggctcttggt 1380  
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<210> 270

<211> 555

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 270

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 gctaatcgcg agggcttgca ggaaacacct gctcgtgtag cccgtatgta tcaagagatt 120  
 ttttcaggtc ttggtcaaac agcagaggaa catttgtcaa aatcctttga aattattgac 180  
 gataatatgg tggtagaaaa ggatatcttt ttccatacca tgtgtgaaca ccacttcttg 240  
 ccattttatg gtagagcgca cattgcctac attccagatg gtcgtgtggc aggcttgtct 300  
 aagctagccc gtacggttga agttttattcg aaaaaaccac aaattcaaga acgtttgaat 360  
 atcgaagtgg ccgatgcctt gatggactat ctagggtgcta aaggagcctt tgttgtcatt 420  
 gaggcggaac atatgtgtat gagtatgcgt ggtgttagaa aaccaggcac tgcaaccttg 480  
 acgacagtag ctcgtggtct atttgaaaca gataaggatc tccgtgaoca agcttatcgt 540  
 ttaatggggc tataa 555

<210> 271

<211> 1050

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 271

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 taccagtaca gtcaactctt acaacatttt cctgaaaatc attggcctat ctttttgttt 180  
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 actggcattt ccctagtctt ttggctcttt gtacagaccc ttttcttgct gttatttgcg 360  
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 tatcaggtaa aacgtcagat gcaggactaa 1050

<210> 272

<211> 1197

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 272

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 gctcctgaat ggtttaaatt attggggaga aaaatggaag ttgtgaattc tacaattcgc 180  
 agtgtacaca ttgataaaga actttttgaa agctataaaa caggacctca tataaattat 240  
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 ttggaattag cggccgagca gaatcaagtt gttcatcttg gggatcagag tattttta 540  
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 atcttcgctt ttgatatac acgtaaaagt atggatgatg gactctatga cggatttttt 1140  
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<210> 273  
 <211> 1218  
 <212> DNA  
 <213> *Streptococcus pneumoniae*

<400> 273  
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<210> 274  
 <211> 2292  
 <212> DNA  
 <213> *Streptococcus pneumoniae*

<400> 274  
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gagtactatc	aagaagccta	cgcgggcttt	gaagctatga	aagaacagat	tcattgcggat	2220
atggtgcgta	atctcctgat	ggggctgggt	gaggtcactc	caaaagggtga	aatcgtgact	2280
cattttccat	aa					2292

<210> 275

<211> 960

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 275

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ctcagcaacc tcttgctcaa actgggtgac aaccagtcac acgccctgct tactgctaac 180  
tatattagaa tcttatcttg ggcagtcatt tttggaatcg ctatgagaga agccagtaaa 240  
aatagtcaag aattgctaaa aactatcgct gacgtgactt ctaaaattgt cgaatggatc 300  
atcaatctgg ctccatttgg aatccttggg cttgttttta aaaccatttc tgacaaggga 360  
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gtcctcagtg tggtagcagc tatctcatcc tgtgatgctt cagggtattgc cggagggttc 780  
ctccttctta tcccagttgc ttgtagcctt ttcgggtattt ctaacgatat tgccatacaa 840  
attgttgggg ttggttttgt gattggtgtc atccaagact catgtgaaac agcccttaac 900  
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<210> 276

<211> 954

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 276

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tctgatacgc gtagaagtac tttaaaactg gctcgcaatc gtcttttttc tatgcttcta 180  
gctctggcta tcgggtgttct agcttttccac ttgagcggat ttcatactct gagtctcggc 240  
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ccaagcactg ttttggttag ccatctcttg gttcaagagt caacctctcc agaccttcta 360  
gtcaatgaat tcttctctt tgctattggg acaggatttg ccttgcttgt taatctctat 420  
atgccttcac gagaagagga aatccagcac taccacacgc tgggtggaaga aaagttaaaa 480

gatatacctcc agcgcttcaa atactattta tccagaggag acggacgcaa ccgagcacag 540  
 ctggtagcag aattagacac gcttttgaaa gaagccctca gactggtcta tttggatcac 600  
 tctgaccacc tctttcacca gacagactac catatccact actttgagat gagacagcga 660  
 caaagtcgta tcttgagaaa catggcccaa cagattaaca cttgtcacct tgccgccagt 720  
 gaaagcctga tcttagcgca actcttttca aaaattgcag gtcaactgag ccagaccaat 780  
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 ctgcccaga caagagaaga atttgaaacc cgcgccaccc ttcttcaact cctacgtgaa 900  
 gccaaaacct tcatccaagt aaaagttgat ttttaccaa aatatagaca gtaa 954

<210> 277

<211> 1614

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 277

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 aatgctgaac aagaagcaac taatttacgt ggacaagctg agcgtgaagc ggatttactt 180  
 gttaatgaag ccaaactgta aagcaagtct cttaaaaaag aagcactatt ggaggccaaa 240  
 gaagaagcca gaaaataccg tgaagaagtg gacgctgaat tcaaatcaga acgtcaagaa 300  
 ctcaaacaaa tcgaaagtgc tttgacagag agagctacta gccttgaccg taaggacgac 360  
 aatttgacga gtaaagaaca aacacttgaa caaaaagaac aaagtatttc tgatagagcg 420  
 aaaaaccttg atgcgcgtga agagcaatta gaggaagtcg aaagacaaaa agaagcagaa 480  
 ctagagcgta ttggtgcgct gtctcaggca gaagcacgag atattatctt ggctcagaca 540  
 gaggaaaact tgaccaggga gattgccagt cgcattcgcg aagctgagca agaggtcaag 600  
 gaacgttctg acaaaatggc caaggacatc ttggttcaag ctatgcaacg tatcgctggt 660  
 gaatatgtag cggagtcaac aaactcaaca gttcatctgc cagacgatac tatgaaggga 720  
 cgcattattg gtcgtgaagg tcgtaacatt cgtacctttg aaagtttgac aggggtcgat 780  
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gatgccttga gcgcagcccg tccaggtgct cgtagtgagt ctcttgaaag ctacatcaag 1380  
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 cttcaagcag gacgtgaaat tcgtatcatg gtcaatccag gaaaaatcaa ggacgacaaa 1500  
 gtcacaatct tggctcacia agttcgtaag aaaattgaaa acaatctcga ttatccagga 1560  
 aatatcaagg taaccgtgat tcgcgagcct cgtgcagtag attatgctaa ataa 1614

<210> 278

<211> 315

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 278

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 ttcaagtctg aaaaaatcaac tcttcgcgct ttagaagaaa tcgaatcagg aaacgttaca 180  
 attcacccag atccagaagg aaaacgtgaa gcagtgcgtc gccgtatcga agaagaaaaa 240  
 cgccgcaaag aagaagaaga aaagaaaatc aaagagcaaa ttgctaaaga aaaagaagat 300  
 ggtgaaaaaa tttaa 315

<210> 279

<211> 792

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 279

atgtcagcat atcaattacc gaccgtatgg caggatgaag ctagtaatca aggagctttt 60  
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 caagctttttc agctttattc actgggaaca ccaaattggtg tgaaggttac tatcttattg 180  
 gaagaattac tagaagctgg ttttaaggaa gcggcttacg acttgataaa gattgctatc 240  
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 gccttatttg accagtcagg tactgaaaac gtaagagtct ttgagtctgc tcatattctt 360  
 ctttaccttg ctgagaaatt tggagccttt ttaccaagta atcctgtgga aaaggtagaa 420  
 gttttgaatt ggctattctg gcaagcaggt gcagcacctt ttctaggtgg gggatttgga 480  
 cattttcttca attatgctcc tgaaaaattg gaatatccta ttaaccgttt tacgatggaa 540  
 gtgaaacgcc agttggattt attggataag gaattggctc agaaacctta tattgcaggc 600  
 aatgactata cgattgcaga tattgctatc tggctttggt atggacagtt agttcaagga 660

aatctttacc aagggttctgc aaaattcttg gatgcctcaa gttatcaaaa tctagtataa 720  
 tgggcagaaa aaattgccaa tcgtccagct gttaagcgtg gcttggaagt aacttataca 780  
 gaaattaaat ag 792

<210> 280

<211> 939

<212> DNA

<213> Streptococcus pneumoniae

<400> 280

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 ggaatcattt ctgcagcgcg tatgtttgtg gtctatctct acaatactcg cctcagtaag 180  
 aaatccaact ccaatgcgct gaaggcagct gctaaggaca atctttctga cgctgttacc 240  
 tcacttgga cgcgcattgc catcctagct agtagtttca attatccgat tgtggataaa 300  
 ctggttgcta tcatcatcac tttctttatc ttgaagactg cctatgatat cttcatcgag 360  
 tcttccttta gtctttcaga tggctttgac gacgcctgc tcgaggacta ccaaaaggct 420  
 atcatggaat ttcccaaaat cagcaaggct aaatcgcaaa gaggtcgcac ctacggtagc 480  
 aacatctacc tggatattac actagagatg aatcctgact tgtctgtttt tgaaagccat 540  
 gaaatcgcg atcaggtcga gtctatgctg gaggagcgtt ttggcgtctt tgataccgat 600  
 gtccatctcg aaccagcacc tatccctgag gatgaaattt tagacaatgt ctataaaaaa 660  
 ttgcttatgc gtgaacaatt gattgaccaa ggaaaccaac tagaagaact cttgactgat 720  
 gattttgtct atattcgcca agatggagag cagatggata aagaggctta taagaccaa 780  
 aaagagttaa attctgctat caaggacatt caaattactt ccatcagtca aaaaaccaa 840  
 ctcactctg atgagttaga tggtatcatc cataccagta tctggcgtcg ccacgaaacc 900  
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<210> 281

<211> 795

<212> DNA

<213> Streptococcus pneumoniae

<400> 281

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 gcggtagctt cgggtcgggg atttctgtct ctagaaaaat tatttgctgg tgttcgtgat 180



gacattatatt tcatcgcgga aaatggcagt ttggtagagt atcaaggtca ggacttgtat 240  
 gaagcgacta tgtctcgtga cttttatctg gcaacttttg aaaagctgaa aacttcacct 300  
 tatgtagata tcaataaaact gctcttgacg ggtaagaagg gttcatatgt tctagatacg 360  
 gttgatgaga cctatattgaa agtgagtcag cactataatg aaaatatcca aaaagtagcg 420  
 agtttggaag atatcacaga tgacattttc aaatttacia ccaacttcac agaagaaacg 480  
 ctggaagatg gggaggccttg ggtaaacgaa aacgttcctg gtgttaaggc catgacaact 540  
 ggctttgaat ccattgatat tgttctggac tatgtcgata agggagtggc cattgttgaa 600  
 ttagttaaaa aacttggtat cacaatggat caggatcatgg cttttggaga caatcttaat 660  
 gaactacata tgatgcaggt tgtgggacat cctgtagctc ctgaaaatgc acgacctgaa 720  
 attttagaat tagcaaagac tgtgattggc caccataagg aacggctcgt tatagcttat 780  
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<210> 282

<211> 819

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 282

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 gtattgacaa ctggctcgtcc cttaaaagcc atggatttct ttctccatga gttagggact 180  
 gacggtcagg aagatgagta taccattact tttaatgggtg gattagttca gaaaaataca 240  
 ggagaaatcc ttgataaaac agtcttttca tatgatgatg tggcacgttt gtatgaagaa 300  
 acagagaaat tatcactgcc tcttgatgcc atctcagaag gaacagttta tcaaatacaa 360  
 toggaccaag aaagtcttta tgccaaattc aatccagctt tgacctttgt tccagtggac 420  
 tttgaagact tatctagtca aatgacctac aacaaatgcg tgactgcctt tgctcaagaa 480  
 cccttggtatg cagccattca gaagatttct ccagaattgt ttgaccaata tgaaatcttt 540  
 aaatcacgtg aaatgttgct agaatggta ccaaagaatg ttcataaagc aacaggtttg 600  
 gcaaaactaa tcagccatct tggaatcgac caaagtcaag tgatggcttg tggtagcgag 660  
 gccaatgacc tctctatgat tgaatgggca ggtcttggtg ttgctatgca aaacgctggt 720  
 cctgaagtaa aggcagccgc aaatgtagtg acgccgatga ccaacgatga ggaagctgtc 780  
 gcctgggcta tcgaagaata tgtgctaaag gagaactaa 819

&lt;210&gt; 283

&lt;211&gt; 1257

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 283

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 caaaggcagg ataggcagga gaaacactta agtaagagct tggaggatca ggcagatcat 120  
 ttgtcagacc agttggatta ccgctttgac caagccagac aagccagcca gttagaccaa 180  
 aaagatttgg aagtgggtgt cagcgaccgt ttgcaagaag tgcggattga attgcaccaa 240  
 ggtctgaccc aagtccgtca agaaatgaca gataatctcc tccaaactag agacaagaca 300  
 gaccaacgtc tccaagcctt gcaggaatca aatgagcaac gtttgaaca aatgcgccag 360  
 acggtcgagg aaaaactaga aaagaccttg cagacacgct tacaggcttc ctttgagaca 420  
 gtttctaaac aactggagtc tgtcaatcgt ggccttgagg aaatgcagac agttgcccgt 480  
 gatgtcggag ctcttaacaa ggttctctct ggaaccaaga cgcgagggat tctgggagaa 540  
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 gaccaagaat acgtctatct gccaatgac tctaagtttc cactggcaga ttattaccgc 720  
 ttggaagaag cctatgagac aggtgacaag gatgagattg aacgctgtcg taagtcactc 780  
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 aatccggtct tctttgatga tttgagacgg gaagaacaga ttattgttgc aggaccaagt 960  
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 ttaaacgctc gtaccatagc tatcgagcgg acgctccgtc acattgagtt gtcagaagg 1200  
 gagcctgcgc ttgatctact ccattttcaa gaaaatgagg aagaatatga agattag 1257

&lt;210&gt; 284

&lt;211&gt; 942

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 284

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 gctgacctga ggcaaacctg agctgggaaa aactacctag cttttacctt ccaagatgat 120  
 agtggcgaga ttgatgggaa gctctgggat gcccaacctc ataacattga ggcctttacc 180

gcaggtaagg ttgtccacat gaaaggacgc cgagaagttt ataacaatac ccctcaagtc 240  
aatcaaatta ctctccgcct gcctcaagct ggtgaaccca atgaccacgc tgattttcaag 300  
gtcaagtcac cagttgatgt caaggaaatt cgtgactaca tgtcgcaaat gatttttcaaa 360  
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<210> 285

<211> 1512

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 285

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<210> 286

<211> 1332

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 286

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<210> 287

<211> 2349

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 287

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 tcactagttc ctatcttaat aggaatatcc tcttttggtg cgagtctttt agttccggtg 180  
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 aaagtcaacc tgaatcttcc tgttccttat gaaccaccta gaagaaaagc gtcgttaatg 2340  
 atgcattaa 2349

<210> 288

<211> 1245

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 288

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 gcctggtatg aagtgttggg aagtctcttc tttattgtca ccatgttggg ggggtggaaag 180  
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 tacaagcatt atcgaaaaag caaggatggc aagtgggtct tctacttagt tagttttctg 300  
 tccctacttc cgattatctt tgtcaagggt caaccagcta tcaatggaac gcagtctttg 360  
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<210> 289

<211> 1269

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 289

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gcagtggtta ctactatcga tagttttaag gagcgaagtc aaaaagtcag agcactatct 180  
gatccaaatg tgcgttttgt tcccttcttt ggctctagtg aatggcttcg ttttgacggg 240  
gctcatcctg cgggtattagc tgagaaatac aatcgttcct accgtcctta tcttttagga 300  
cagggggggag ctgcatcgct taaccaatat tttggaatgc aacagatggt accacagctg 360  
gagaataaac aagttgtgta tggttatctc cctcagtggt tcagtaaaaa tggctatgat 420  
ccagcagcct tocagcagta ttttaatgga gaccagttga ctagttttct gaaacatcaa 480  
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catctgaatg agcgcttttt cagcaaagat tgggcgactt atgatggaga tgtcaaagaa 1260  
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&lt;210&gt; 290

&lt;211&gt; 621

&lt;212&gt; DNA

&lt;213&gt; Streptococcus pneumoniae

&lt;400&gt; 290

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 aaggaccgca ccttgagtga ctatgcaggt aactggcaat cagtttatcc tttccttgaa 180  
 gacggcacgt ttgaccaagt ctttgactac aaggctaagt tgactggtaa gatgaccag 240  
 gctgagtaca aggottacta tacaaaaggc tatcatacag atgtgactaa gattaacatt 300  
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 gtcggtgaaga aaattttgac ttacaagaaa ggcaatcgtg gcgtgcgttt cctctttgaa 420  
 gccacagatg ctgacgctgg acaattcaag tatgttcagt ttagtgacca caatgttgcc 480  
 ccagttaagg cagaacattt ccatatcttc tttggaggca caagccaaga agccctcttt 540  
 gaagaaatgg acaactggcc aacctactac ccagataacc tatctggcca agaaatcgcc 600  
 caagaaatgt tggcgcattg a 621

&lt;210&gt; 291

&lt;211&gt; 444

&lt;212&gt; DNA

&lt;213&gt; Streptococcus pneumoniae

&lt;400&gt; 291

atgaaagatg gtcatttgct agcccatcat attcgtttgt tgaatgggcg gatttttcaa 60  
 aagttactga gtcaagatcc tgaggctctt tataggggtg aacagggcaa gatttttagcg 120  
 gttttatgga atagtgaaac tggctgcgca actgcgacag atatcgcgct tgcgactgga 180  
 cttgogaata atacgctgac gactatgata aaaaagctag aggaacaaaa gcttgtaatt 240  
 gttagtccgt gtggaaaaga caagcgtaag aagtatttag ttttaacgga gttaggcaag 300  
 tcccagaaag aagtggggca tcgtgtcagt cagaaattgg atactatctt ttacaaagga 360  
 ttttcagagg aagaaattca ccaatttgaa ggttttcaag aaagaatttt ggcgaatctg 420  
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<211> 1521

<212> DNA

<213> Streptococcus pneumoniae

<400> 292

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gctgtttttc	ttcgctatca	tgagaagctg	gccgactggg	tcttgccagat	tgcagggtatt	180
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caagggttgt	tgaagaaatg	a				1521

&lt;210&gt; 293

&lt;211&gt; 810

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 293

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 gggaaatata taatttatct cattaacagt ctagttggtt ggtatcaatg gagcaaggca 780  
 gctaagcaga atactgattt acttaactag 810

&lt;210&gt; 294

&lt;211&gt; 900

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 294

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<210> 295

<212> DNA

<213> Streptococcus pneumoniae

<400> 295

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gaaccctttt	cggccttgga	tgctatttcg	agaaaacagt	tgcaggttct	gacaaaagaa	540
ttgcataaag	agtttgggat	gacaacgatt	tttgtaaccc	atgatacggg	tgaagccttg	600
aagttggcgg	accgtattgc	tgtcttgag	gatggagaaa	ttcgccagg	agcgaatccc	660
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<210> 296

<211> 1083

<212> DNA

<213> Streptococcus pneumoniae

<400> 296

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ctagcccagt tactaaggac aaaacctcaa catatctttt tcaacttctgg tgggactgaa 180  
ggcaataata ctaccatcat tggctactgt cttcgtcacc aagaacaagg aaaacatatc 240

atcacaactg ccatogagca ccatgctgtc cttgaaacaa ttgattactt ggttcaacac 300  
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 caaaaggctt tacgtgacga tacgattttg gtttctacca tgtttgtcaa taatgagaca 420  
 ggaaacctac tgcccatcgc tgaaattggc caaatactca agcaacaccc tgctgcctat 480  
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 gattttctca ctgcttctgc ccacaaattc catggctcta agggaatcgg ttttctctac 600  
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 gccatgtatg gcgcaaattc agaacgcttg aaggaatccc ttcgcatcag tttgtcgcca 1020  
 caaaataccg ttgaagacct acaaacctc gcaaaaacct taaaagaaat tatcggaggt 1080  
 tag 1083

<210> 297

<211> 1380

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 297

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 ccttttgtcc aagttgaaag ctcacgagcg acttattttg atcatctttt cactgctgtc 180  
 tctgcagtct gtgtgacggg tctctcaacc cttccagtag ctcacaccta taatatctgg 240  
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 gatagtttta gttatggaga aactcgatct ttgagaaagt ttgtctattc tatttttctc 420  
 acgacctttt tgggtgagag cttgggagct attttgctta gttttcgctt tattcctcaa 480  
 cttggctggg gacgtggtct ttttagttcc atttttctag cgatctcagc cttctgtaat 540  
 gccggttttg ataatttagg gagcaccagt ttatttgctt ttcagaccga tttactgggtc 600  
 aatctggtga ttgcaggctt gattattaca ggcggccttg gttttatggt ctgggttgat 660  
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 acagttggtg taacggcaaa tctgactcct gaccttggga aattggctct cagtgttata 1260  
 atgccactta tgtttatggg acgaattggt cccttgacct tgtttgtag cttggcagat 1320  
 taccatccag aaaagaaaga tatgattcac tatatgaaag cagatattag tattgggttaa 1380

<210> 298

<211> 666

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 298

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 gccctagcca agcaggatat gaattattatc gctattgatg accacgcaga gcgcatcaat 120  
 cagttttgagc cagttttggc gcgtggagtg attggtgaca tcacagatga agaattattg 180  
 agatcagcag ggattgatac ctgcgatacc gttgtagtcg cgacagggtga aaatctggag 240  
 togagtgtgc ttgcggttat gcaactgtaag agtttggggg taccgactgt tattgctaag 300  
 gtcaaaagtc agaccgctaa gaaagtgcta gaaaagattg gagctgactc ggttatctcg 360  
 ccagagtatg aaatggggca gtctctagca cagaccattc ttttccataa tagtgttgat 420  
 gtctttcagt tggataaaaa tgtgtctatc gtggagatga aaattcctca gtcttgggca 480  
 ggtcaaaagtc tgagtaaatt agacctcgt ggcaaatata atctgaatat tttgggtttc 540  
 cgagagcagg aaaattcccc attggatggt gaatttggac cagatgacct cttgaaagca 600  
 gataacctata ttttggcagt catcaacaac cagtatttgg ataccctagt agcattgaat 660  
 tcgtaa 666

<210> 299

<211> 540

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 299

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 gtggagtcgc tagtgattgg tgggtgagcaa gttgggattt tgattatcaa tgacgggtct 120

atgaaattca	atccaaatca	aagatatatact	cgttggtcta	ttcgccgtct	cagtgtcggt	60
gttgccctcag	ttgttgtggc	tagtggttc	tttgtcctag	ttggtcagcc	aagttctgta	120
cgtgccgatg	ggctcaatcc	aaccccggt	caagtcttac	ctgaagagac	atcgggaacg	180
aaagaggggtg	acttatcaga	aaaaccagga	gacaccgttc	tcactcaagc	gaaacctgag	240
ggcgttactg	gaaatacgaa	ttcacttccg	acacctacag	aaagaactga	agtgagcgag	300
gaaacaagcc	cttctagtct	ggatacactt	tttgaaaaag	atgaagaagc	tcaaaaaaat	360
ccagagctaa	cagatgtctt	aaaagaaact	gtagatacag	ctgatgtgga	tgggacacaa	420
gcaagtccag	cagaaactac	tcctgaacaa	gtaaaagggtg	gagtgaaaga	aaatacaaaa	480
gacagcatcg	atgttcctgc	tgcttatctt	gaaaaagctg	aagggaagg	tcctttcact	540
gccggtgtaa	accaagtaat	tccttatgaa	ctattcgctg	gtgatggtat	gttaactcgt	600
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tggtcagata	acggcgacgc	taaaaaccca	gccctatctc	cactaggcga	aaacgtgaag	1140
accaaaggtc	aatacttcta	tcaagtagcc	ttggacggaa	atgtagctgg	caaagaaaaa	1200
caagcgctca	ttgaccagtt	ccgagcaaata	ggtactcaaa	cttacagcgc	tacagtcaat	1260
gtctatggta	acaagaacgg	taaaccagac	ttggacaaca	tcgtagcaac	taaaaaagtc	1320
actattaaca	taaacggttt	aatttctaaa	gaaacagttc	aaaaagccgt	tgcagacaac	1380

<210> 301

<212> DNA

<400> 301

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gttgtttttt	gggctgttca	aaaaatgctg	attgcgaaag	gcgagattta	ctttttgctt	120
gggatgacca	tcgttgccag	ccttgctcgt	gctgggatta	gtctctttct	cctattgcca	180
gtctttacgt	cgttgggcaa	actcaaggag	catgccaaag	gggtagcggc	caaggatttt	240
ccttcaaatt	tggaggttca	aggtcctgta	gaatttcagc	aattagggca	aacttttaat	300
gagatgtccc	atgatttgca	ggtaagcttt	gattccttgg	aagaaagcga	acgagaaaag	360
ggcttgatga	ttgccagtt	gtcgcattgat	attaagactc	ctatcacttc	gatccaagcg	420
acggtagaag	ggattttgga	tgggattatc	aaggagtcgg	agcaagctca	ttatctagca	480
accattggac	gccagacgga	gaggctcaat	aaactggttg	aggagttgaa	ttttttgacc	540
ctaaacacag	ctagaaatca	ggtggaaact	accagtaaag	acagtatttt	tctggacaag	600
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aacatgaaga	caggtggtca	tggattagga	cttgcgattg	cgcgatgaatt	ggcccatcaa	960
ttgggtgggg	aaatcacagt	cagcagccag	tacggtctag	gaagtacctt	taccctcgtt	1020
ctcaacctct	ctggtagtga	aaataaagcc	taa			1053

<211> 528

<212> DNA

<213> Streptococcus pneumoniae

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ctgtgaata	taggtccaca	attggcggtt	ttttgccaga	tgtccgctg	ttccagatcg	120
gttgagcagg	gtactggaaa	tcaccgtcgt	gagttcaata	tgattcagca	gatattctcg	180
cattttggga	tgactcactt	gggacaaatc	aagttgggtct	atcaagagtc	gattgacctt	240
gagttgctgg	tcaatgcact	taatcatcac	ttgtcattg	acagactggt	cctcacgccc	300
aatcaaataa	cgatagaaat	cgacaggcag	atagtacatg	gtcttgacct	gctgaagggg	360
cgtaaagaca	aagagattat	cgacataaaa	agtatgttca	ggcagttaga	actggctagc	420
acgcaacaaa	tctgtccgat	aaatcagcga	gtgcatcatg	gtatactggc	ctttggagaa	480
atttcgacc	tgggtcccgc	caaaaatctg	ccgaacaggc	aagactga		528

<211> 477

<212> DNA

<213> Streptococcus pneumoniae

atggaacatt	tagcaactta	tttttcaacc	tatggaggag	ctttcttcgc	tgcattggga	60
attgtattgg	cggttggatt	aagcggtatg	gggtctgctt	atggagttgg	taaggctggg	120
caatctgccg	cagctttact	gaaagaacag	cctgaaaagt	ttgcctcagc	tttgatattg	180
caattattgc	cgggaacaca	aggattatat	ggttttgtta	ttggaatttt	aatttggttg	240
caattaactc	cagaacttcc	tttagaaaaa	ggcgttgctt	atttctttgt	agctcttcca	300
attgctattg	taggatactt	ttcagctaag	catcaaggaa	atgtagcagt	agcgggaatg	360
caaatcttgg	ctaaaagacc	aaaagaattc	atgaagggag	caatttttagc	tgccatggta	420
gaaacctatg	caattcttgc	ttttgtcgta	tcattcattt	tgaccottcg	tgtataa	477



&lt;210&gt; 304

&lt;211&gt; 498

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 304

atgttaaaat cagaaaaaca atcacgttat caaatgttaa atgaagaatt gtccttccta 60  
 ttggaaggcg aaaccaatgt tttggctaata ctttccaacg ccagtgtctt cataaaatca 120  
 cgttttccta ataccgtatt tgcaggcttt tatttggtcg atggaaagga attgggttta 180  
 ggcccccttc aaggaggtgt ttctgtcatc cgtattgcac taggcaaggg tgtttggtgt 240  
 gaggcagctc actttcagga aactgttatt gttggagatg tgacgaccta tctcaactat 300  
 atttcttggtg atagtctagc taaaagtga attgtggtgc cgatgatgaa gaatggtcag 360  
 ttacttgag ttctggatct ggattcttca gagattgagg attacgatgc tatggatcga 420  
 gattatattg aacaatttgt cgctattttg cttgaaaaga cagcatggga ctttacgatg 480  
 tttgaggaaa aatcttaa 498

&lt;210&gt; 305

&lt;211&gt; 771

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 305

atgtcagtat tagagatcaa agatcttcac gttgagattg aaggaaaaga aattttaaaa 60  
 ggggttaacc tgacctgaa aacaggagaa attgccgcta tcatgggacc aaatggtaca 120  
 ggtaaatacga ctctttctgc cgctatcatg ggaaatccaa actatgaagt aactaaaggt 180  
 gaagttttgt ttgatggcgt aaacatcctt gagttggaag tggatgagcg tgcgcgtatg 240  
 ggacttttcc ttgctatgca ataccatca gaaatccctg gaattaccaa tgctgagttt 300  
 ctctgtgccg ctatgaatgc gggtaaagaa gatgatgaga agatttcagt tcgtgagttt 360  
 attactaagc tagatgaaaa aatggaattg ctcaacatga aagaagaaat ggcagagcgt 420  
 tacctcaacg aaggcttctc tgggtggtgag aaaaaacgca atgaaattct tcaacttttg 480  
 atgttgagac caacatttgc tcttttgac gagattgact caggtcttga tattgacgct 540  
 cttaaagttg tgtctaaagg tgtcaatgcc atgcgtggtg aaggttttgg tgctatgac 600  
 atcactcact accaactctt tttgaactat atcacacctg atgtggtaca cgtgatgatg 660  
 gaaggtcgtg ttgtccttcc tgggtgtcca gaattggctg cgcgtttgga acgtgaagga 720  
 tacgcaaaat tagctgaaga acttggtctac gactacaagg aagaattgta a 771

09769787 045604

<211> 471

<212> DNA

<213> Streptococcus pneumoniae

<400> 306

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gagcaaatca	gtotcaacaa	tccgacttgt	ggggatgtca	tcaacctctc	tgtcaagttt	180
gatgcagagg	accgtttgga	agatattgct	tttctaaatt	caggatgcac	gattttcaact	240
gcttctgcta	gtatgatgac	agatgccgtt	ttaggaaaaa	ccaacaaga	aatttttagaa	300
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gggagacgcg	cattcttgtc	aggtgttgcc	aaattccctc	aaagaatcaa	gtgtgcaacc	420
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<210> 307

<211> 1953

<212> DNA

<213> Streptococcus pneumoniae

<400> 307

atgaaaattc	aagacctatt	gagaaaagat	gtcatgttgc	tagatttgca	ggcaactgaa	60
aaaacagctg	tcatcgacga	gatgattaaa	aatttgacag	accacggtta	tgtaacagat	120
tttgaaacat	ttaaagaagg	aattttggcg	cgtgaagctt	tgactttctac	tggtttgggt	180
gatggaatcg	caatgcctca	cagcaaaaac	gctgctgtca	aagaagcgac	agttctatct	240
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caagttatcg	aactttttga	ccaagcttca	gaaaaaactg	aggaacttgt	tcaagcacct	480
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 ttgacaaaca tcatcatggg ctgtcattt atcactgagg gagcgattcc atttggtgcc 1740  
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 gttggtctta ctggtatcaa actcatggcg ccacacggag gaatcttcgt tatcgccctt 1860  
 acttcaaagt ctctccttta cctcgtttct gtcttggtag gagcaatcgt aagtgggtgtg 1920  
 gtttatgggt acctacgcaa accacaagca taa 1953

<210> 308

<211> 2304

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 308

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 gccttcaaat taggggctgc aggtataacc ctttataatt taattcgctt gctagtgggt 180  
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 acccgtctca tggaagaact ggagatagca ggtgtcatcg gtccagctga aggtacccaa 2280  
 cctcgaaaag tgttacaaca ataa 2304

<210> 309

<211> 528

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 309

atgagttatt ttaaaaaata taaattcgat aaatcccagt tcaaaacttgg tatgcgaacc 60  
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 ggtcttcaaa ttggtgcttt gacagccgtt tttagcctga gggagagttt tgatgagagt 180  
 gttcattttg ggacttcgag tattctagga aatagtatcg gtggactcta tgccttggtc 240

ttcttcttat taaatacctt tttccacgaa gccttttggg tgaccttggg agttgttcca 300  
 atctgcacca tgttaaccat tatgacaaat gtagccatga ataacaaagc aggggttatt 360  
 ggtggtgtag cagctatgtt aatcattacc ctatcaattc caagtgggga gacaattttg 420  
 tacgtgtttg tgcgtgtatt agaaacgttt atgggagttt ttgtcgcaat tatcgtaaatt 480  
 tacgatattg atcgtattcg tctcttttta gagaaaaaag aaaaataa 528

<210> 310

<211> 471

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 310

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 catacacagg ctgagttgca agcccttctt gctgagaacg acattcaagt aaccaggca 120  
 accctctcac gcgacatcaa aaatatgaac ctatcaaaaag tccgcgaaga agatagcgct 180  
 tattatgttc ttaacaatgg ttccatctca aaatgggaaa aacgtctcga actctacatg 240  
 gaagacgccc ttgtctggat gcgcccagtt caacaccaag tctactaaa aacccttctt 300  
 ggactggctc aatccttttg ttctatcatt gatactttga gcttccctga cgctatcgct 360  
 accctttgtg gtaatgatgt ctgtcttata atctgtgaag atgcagatac tgctcaaaaag 420  
 tgctttgaag aactgaaaaa attcgcccca ccatttttct ttgaagaata a 471

<210> 311

<211> 1488

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 311

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 ttcaactcag tcgacactat tttgtcattt ttcttgcctt ttgcaactta tgggtgtctat 180  
 aactacgggt taagggctat cagtaatgtc aaggataaca aaaaagatct taacagaacc 240  
 ttttctagtc ttttttattt gtgcacgct tgtacgattt tgaccactgc tgtctatatc 300  
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 tacagttttc tctttttacaa aactgccttc atccgtatcc tgatgctggg ctctattttc 480  
 ttatttgtta aaaatgaaca cgatattggt gtctatacac ttgtgatgag tttatcgacg 540

ctgattaact acctgattag ttatTTTTtg attaaaagag acatcaaact tgttaaaatt 600  
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 gccaatatgc tcttcacttt tttagatcgc ctcttcctcg ttaaaacagg gattgatgtc 720  
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 tatcctgtag atatgggtcat taatttgcca tttttgatta atactggtt gattgtcttg 1380  
 ctatcagcta tctcttatat tagtctactt gtcttcacaa aagatagcat tttctatgaa 1440  
 tttttaaaacc atgtcctagc cttaaaaaat aaatttaaaa aatcatag 1488

<210> 312

<211> 804

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 312

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 gatactctct gtaaaaagca caatatcaac tatattatta actacggtac tctgattggg 120  
 gcggttcgac atgagggcct tatcccttgg gacgacgata ttgatctgtc catgcctaga 180  
 gaagactacc aacgattttat taacattttt caaaaggaaa aaagcaagta taagctccta 240  
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 aaaattattg atactcgaaa taaaaaaacc tatgagtctg gtatctttat cgatattttc 360  
 cctatagatc gotttgatga tctaagggtc attgatactt gttataaaact ggaaagcttc 420  
 aaactgctgt ctttcagtaa acataaaaat attgtctata aggatagcct tttaaaagat 480  
 tggatacgaa cagccttctg gttactcctt cgaccggttt ctctcgtta ttttgcaaatt 540  
 aaaatcgaga aagaaattca aaaatatagt cgtgaaaatg ggcaatatat ggctttttatc 600  
 ccttcaaaat ttaaggaaaa ggaagtcttc ccaagtggta cctttgataa aacaatcgat 660  
 ttaccctttg agaatttaag ctttcctgca cctgaaaaat ttgatactat tttgacacaa 720  
 ttttatggag atttatatgac cctaccacca gaagaaaaac gcttctacag tcatgaattt 780  
 cacgcttata aattggagga ttag 804

<211> 1527

<213> Streptococcus pneumoniae

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gacctaacca	tgaccatcca	agacggggaa	aaggttgcta	ttattggtga	agaaggaaat	120
ggcaaatcaa	ccttacttaa	aattttaatg	ggggaagctt	tgtctgattt	cactatcaag	180
ggaaacatcc	aatctgacta	tcagtcactg	gcctacattc	ctcaaaaagt	ccctgaggac	240
ctaaaaaaga	aaactttaca	cgactacttc	tttttagatt	ctattgattt	agactacagt	300
atcctctatc	gtttggcgga	ggaattgcat	tttgatagca	atcgtttcgc	aagtgaccaa	360
gagattggca	atctatcagg	gggcgaagct	ttgaaaattc	agcttatcca	tgagttagcc	420
aaaccctttg	agattctatt	tttagatgaa	ccttcaaatg	acctagacct	tgagacagtt	480
gattggctaa	aaggccagat	tcaaaagacc	aggcaaacccg	ttattttcat	ttcccatgat	540
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aaagaagcgg	aaacgctagt	agagcattta	gactatgata	gctatagtga	gcagagaaaag	660
gctaattttg	ccaaacaaag	tcagcaagct	gctaacaacc	aaagagccta	cgataaaaacc	720
atggaaaaac	atcggagagt	taagcaaaat	gtagaaactg	cgcttcgcgc	taccaaagat	780
agtactgccg	gtcgcctatt	ggctaaaaag	atgaaaactg	tcctctcaca	agaaaaacgc	840
tacgaaaagg	cagctcagtc	catgactcaa	aagccacttg	aagaggaaca	aatccaactt	900
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gaactacaga	aaatccaatc	tcacctagct	agtctcaatt	tcagttatcc	agaaatgcag	1260
catcaaattc	gtcctttatc	tgggcgacaa	cagggaaaaa	tcctgctttt	ggatttagtc	1320
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caaccccaaa	tcagaaaact	ctttgctacc	tatccaggcg	gtctcatcac	tgtttcgcac	1440
gaccgtcggt	tottaaaaga	agtctgctcg	atcatctatc	gcatgacaga	acacggtttg	1500
aagctaqtta	atttagaaga	tttataa				1527

&lt;210&gt; 314

&lt;211&gt; 714

&lt;212&gt; DNA

&lt;213&gt; Streptococcus pneumoniae

&lt;400&gt; 314

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 caaaaagaac aatttgaacg ttattttgag ctcttggtcg agtggaatga gaagattaat 120  
 ttgacggcga ttacggacaa ggaagaagtt tatctcaaac atttttacga ttcgattgca 180  
 cccattcttc aaggtttgat tcccaatgaa actatcaaac ttcttgatat cggggctggg 240  
 gcaggatttc ctagtctacc aatgaaaatt ctctatccgg agtttagatgt gaccattatt 300  
 gattcactca ataagcgcac caacttccta caactcttgg ctcaagaact ggatttgaac 360  
 ggagttcatt tctaccacgg acgtgccgaa gattttgccc aagacaagaa cttccgtgct 420  
 caatatgatt ttgtaacagc tcgtgcggtt gcccgatatgc aggtcctatc tgaattgact 480  
 attccctacc ttaaggttgg tggcaaaacta ttagcactca aggctagcaa tgcgcctgag 540  
 gaattattag aagctaagaa tgccctcaat ctcttttcta gtaaggctga agacaatctc 600  
 agctacgccc taccgaatag agatccgcgc tatatcacag tggtagaaaa gaaaaaagaa 660  
 acaccaaata aatatccacg taaggctggg atgccaaata aacgccact ttaa 714

&lt;210&gt; 315

&lt;211&gt; 807

&lt;212&gt; DNA

&lt;213&gt; Streptococcus pneumoniae

&lt;400&gt; 315

atgagtatta aactaattgc cgttgatata gacggaaccc ttgtcaacag caaaaggaa 60  
 atcactcctg aagttttttc tgccatccaa gatgccaaag aagctggtgt caaagtcgtg 120  
 attgcaactg gccgccctat cgcaggcgtt gccaaacttc tagacgactt gcagttgaga 180  
 gacgaggggg actatgtggt aacottcaac ggtgcccttg tccaagaaac tgctacagga 240  
 catgagatta tcagogaatc cttgacttat gaggattatc tagatatgga attcctcagt 300  
 cgcaagctcg gtgtccacat gcatgccatt accaaggacg gtatctatac tgcaaatcgc 360  
 aatatcgga aatacactgt acacgaatca accctcgtca gcatgcctat cttctaccgt 420  
 acccctgaag aaatggctgg caaagaaatt gttaaagtga tgtttatcga tgaaccagaa 480  
 attctcgatg ctgcgattga aaaaattcca gcagaatttt acgagcgcta ctccatcaac 540  
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 actcacttgg ctgaaaaact cggattgacc aaagatgaaa ccatggcaat cgggtgatgaa 660  
 gaaaatgacc gtgccatgct ggaagtcgtt ggaaaccccg ttgtcatgga aaatggaaat 720



ccagaaatca aaaaaatcgc caaatacatc accaaaaacaa atgacgaatc cggcgttgcc 780  
catgccatcc gaacatgggt actgtaa 807

<210> 316

<211> 561

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 316

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aacggttttg ttaaaaatcg tatgcaaacc aaggaggctt ggagtcagat tgatgttcag 120  
ttgaaacgct gcaatgacct cttgccaaac ttgattgaga ctgtaaaagg ttatgccaaa 180  
tatgaagggt ctacccttga aaagggtggca gaactacgta accaagtggc ggcagcgact 240  
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gcagttgcag aaagctatcc agatttgaaa gctagtgcta actttgttaa attgcaagag 360  
gagttgacaa acacagaaaa taaaatttct tactctcgtc aactctataa cagtgttgct 420  
agcaactaca atgtaaaatt agaaactttc ccgagcaata ttatcgctgg aatgtttgga 480  
tttaaagcgg cagatttcct tcaaacacct gaagaggaaa agtcggttcc taaagttgat 540  
tttagcggtt taggtgacta a 561

<210> 317

<211> 900

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 317

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ggtgggtttg ttattgcact gattatcggc tttatctacg ctttgtctat gatttttcaa 180  
tcgacagaga ttgtcatgtc catgaatgga gcgcgtgagg tggatgagca aacggcacca 240  
gacctctacc atgtagtgga agatatggct ctggctcgctc agattcctat gccccgtgtt 300  
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atgggacatg aagtcagtca tattogtaat tatgatatcc gtatttcgac tattgcagtt 480  
gcccttgcta gtgctatcac catgctttct agtatggcag gtcgtatgat gtgggtgggt 540  
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ctagtgggtt ccctactagc tattgtactg gcacctctcg ctgcaacctt gggtcagctc 660  
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 cccaggggaa tgattaatgc cctagataag ttggacaata gcaaacctat gagtcgccac 780  
 gtcgatgatg ctagcagtgc cctttatata aatgatoccta agaaaggtgg ggggttccaa 840  
 aaactctttt ataccacccc acctatctca gaacggattg aacgtttaaa acagatgtaa 900

<210> 318

<211> 543

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 318

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 cttgcagttg ggaaagtaca atatgaagac cgtatgtatt tcttagatta tcaactatct 180  
 tataaccattg ttcttgcttc gagtcgcagt atggagccag ttgagttagt tgaatcttat 240  
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 gatgacttgg tcttgcccat cgaaaatggg gagcttgacc ttgctgagag tgtatcagac 360  
 aatatcctgc taaacattcc tatcaaggctc ttgacggctg aagaagaagc tgggtcaagga 420  
 tttatctcag gaaatgactg gcaaatcatg acagaggaag aataccaagc tcaaaaagca 480  
 gtaaagaaaag aagaaaacag tccttttgct ggcttacaag gactatttga cggagatgaa 540  
 taa 543

<210> 319

<211> 861

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 319

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 ttgggtgata ttgcagatat ctcaggttgc cgtaatccag ccgtttttat ggaacgttat 180  
 tttcagatag acgatgcgca tttgtcgaaa gagtttcaaa aatttccatc tttctctatt 240  
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 tacaagggaa atcttgacct cctgaaattc ccgaaggtag cggtcgtggg cagtcgtgct 360  
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gttattgtca gtggtctggc caagggcatt gacacagcag ctcatatggc agctcttcag 480  
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gacggttgcc atcatttgat tcaagaagga gcaaaattgg tcaccagtgg gcaagatggt 840  
cttcggaat ttgaatttta a 861

<210> 320

<211> 534

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 320

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ttctgggtca tgcaacacta tgaaacagtc gaagctgtca cctttgacta cggccaacgt 120  
catcacctcg aaattcaaat tactagagaa atcgctaagg aacagggcat tcgtcaccat 180  
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gtcaacttgc tagaccctcg ctatttagaa gtctggggaa aattcactcc gcgcggtggc 420  
atttcaatcg accoctacta caactacggt aagcaaggaa ctaagtatga gggcttggca 480  
gaacaacgcc tcttccaaca cgacctttat ccagagaaaa ttgacaaccg ctaa 534

<210> 321

<211> 3711

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 321

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acaaatgagt cagcagtact tgaaaaaact gtagagaaaa cggatgcttt ggcaacaaat 180  
gatacagtag ttctaggtac gatattctaca agtaattcag cgagttcaac tagtttgtca 240  
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<210> 322

<211> 1350

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 322

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 acgggtgatt atgctcagtt atttacttca atcatttcaa atccagccat tgccttagga 420  
 gctcaagcgg cttttatcct attgaatata ttcattgtat cacgtggggg tcaaaaaggg 480  
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&lt;210&gt; 324

&lt;211&gt; 651

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 324

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 tttatgctct attaccgtcg atttaaaatg ttagcttgga tgatcatact tgccatttta 180  
 ccatcttttg ccaactactg ggcagttcag ttacacggag atgcttcaca ggcagtcag 240  
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 ttaatatacc tgcttttctt tttattgctt caaacagtc tatttttata a 651

&lt;210&gt; 325

&lt;211&gt; 525

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 325

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 ggagagattt tgggaacagg tattattggt tccattgttt cctatcctgt tatgggtactc 360  
 tttacaggat cagctgctaa gcttagctgg tttatctaca cgctcgatt tttcggagca 420  
 accttgattg gtacagcgat ttccctttatt gcctttcgat ttttaataca gcaggaattc 480  
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0976997 01504

&lt;210&gt; 326

&lt;211&gt; 804

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 326

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 aatttggggc atttgtcagc tgagaaggaa aaagcaatcc gcatggcagc ttcgtatgca 240  
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 gatcaagaaa cggaggattt gcttcaagtc ttgaaagact ggtgtcagac ctatcctggt 480  
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 cgttaccaag tactcaatca gctttcgctc ctaagaagag atgaaaattg gctagatacc 780  
 atcaaaggag aggtttatga atag 804

&lt;210&gt; 327

&lt;211&gt; 834

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 327

atgaaccata aaatcgcaat tttatcagat gttcatggca atgcgacggc gctagaagca 60  
 gtgattgcag atgctaaaaa tcaagggggc agtgaatatt ggcttctggg agatattttt 120  
 cttctgggtc caggcgcaaa tgacttagtc gccctgctaa aggaccttc tatcacagca 180  
 agtggttcgag gcaattggga tgatcgtgtc cttgaggctt tagatgggca atatggctta 240  
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 gagaatgata cagagaaatt tgaccaactg ctagatgcgg aaacggacgt ggcagtttat 480  
 ggtcatgttc acaagcagtt gcttcgttat ggaagtcaag ggcaacaaat catcaatcca 540  
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gccgtgatag aagttgaaga tggggaatta ctcaatatcc aatttcgtaa agttgcttat 660  
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 gaagaactgc gtcgtgacga taactatcag gggcacaatc tggaattatt agccagctta 780  
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<210> 328

<211> 726

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 328

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 cgtactcgta aggtagaggg aagaaaaaaa ctagctagat tgattgtcaa ggtggaaaat 240  
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 caggatttga ctgtggacaa tacggttacc tgggacttat ctatgctcaa gttcttggtc 600  
 aatgaattag acatagcaag tcttcgccag aagtttgagt ctactgaata ttttattcct 660  
 aagtctgaaa aattcttcct tggtaaagat agaaataatg ttgaattgtg gtttgaagaa 720  
 gtatga 726

<210> 329

<211> 936

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 329

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 gaccagagc atggcttgca gactgaggca ggactagttt atgacctagc tagtgtcagc 180  
 aaggttggtg gggttggcac agtttgtacc ttcttggtgg aaataggtca attagatatt 240  
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<210> 330
<211> 483
<212> DNA
<213> Streptococcus pneumoniae
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<210> 331
<211> 792
<212> DNA
<213> Streptococcus pneumoniae
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gggcccgatc tagctaaatt cgatggacaa gcaattaaaa atgacttatt aaaatcagca 180  
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 atcoccgtgt tgatatattt agtgactgtg ctgataattg caattataac ctatttcttt 420  
 gggacttttt ctccctcttg atggaattct ctatttcttg atggaagtgg tttacaaaga 480  
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 ttcacatgat caatctattt tttacaaata gttgattatg tggggaatgt gactcgttcg 600  
 gcaatcacct atttgatgtt tctttggctt gggtctatgc tgccttatag tgccttgcc 660  
 tactatatgg ttccatgac gagtttgatg caagctagct atggggatgt aagtttgatg 720  
 aaactcttta ctccctatat cctttatatt gtcccttaca tgggtgcttga aaaatatgaa 780  
 gataatgttt aa 792

<210> 332

<211> 651

<212> DNA

<213> Streptococcus pneumoniae

<400> 332

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 caggatgctg ttatcttttt caagagagaa ttgatttcaa ttttttcccta taatgactat 180  
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 tggctctctg tcattttact tgaaagtgat ttggcagacc attaccatca cttgattcgc 300  
 tatcaatcaa gtcctttttt cgattataca aggaaacgat tgggtgtcat ttctaaattt 360  
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 acagtcgcac ttttcttttt acttgctcag ttaatgatgt tgtacttact actgtcttat 480  
 ctgatagcac tgattagtgc gggcgtggt ttttcccttt ttctctatatt ttttagcattt 540  
 gtgggacaag aatggatgat ggatcatatt gtaacagtgt atttagtact ctttaagttta 600  
 ttagttatgt tgattgttag tcgcttgga gagaaattta agaaaggata a 651

&lt;210&gt; 333

&lt;211&gt; 525

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 333

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 gtcaacaagg ctccaaccct tcaattggca aatggtaaaa cagcgacttt cctaaccag 120  
 tatgatagca agacottggt gtttgcagta gataaggaag atatcggaca ggaaattatt 180  
 ggtatagcta aaggaagcat cgaaagtatg cataatcttc ctgtaaatct agcagggtgcc 240  
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 gcacttcctg aaacaggaaa caaggagagt gacctcctag cttcactagg actaacagct 480  
 ttcttccttg gtctgtttac gctagggaaa aagagagaac aataa 525

&lt;210&gt; 334

&lt;211&gt; 1518

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 334

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 tatccaatac tagacaatag tatttttcaa tcaatattcc aagtaatgag ctctgcagga 180  
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<210> 335

<212> DNA

<213> Streptococcus pneumoniae

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<210> 336

<211> 840

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 336

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 accaactatg gtttgattat ggcaggagct gcccttgctg ctgttccaat cgtcacagtc 780  
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<210> 337

<211> 1890

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 337

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<210> 338

<211> 2661

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 338

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 gagttgaaaa acaatacga tggcacaact gtttcgcaaa ggacagaggc gcaaacagga 240  
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<210> 339

<211> 1998

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 339

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<210> 340

<211> 1173

<212> DNA

<213> Streptococcus pneumoniae

<400> 340

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 caagtatgga agttggatga ttctgtattcc tatgatgatc gggtgcaaat tgtaagagac 240  
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<210> 340

<211> 1173

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 340

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&lt;210&gt; 341

&lt;211&gt; 1566

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 341

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 aaataa 1566

&lt;210&gt; 342

&lt;211&gt; 741

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 342

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 cttcaacgct atctcaaata a 741

&lt;210&gt; 343

&lt;211&gt; 690

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 343

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690

<210> 344

<211> 1040

<212> DNA

<213> Streptococcus pneumoniae

<400> 344

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gtatctactt tgaaacaagt tggtaacaact gtaaaagata tttctaacaa ggcagaaaga 900  
ggagaattcc ctggcgggtca agtgatcgtt tactcattga aggataaagg ggttgacttg 960  
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cttgatggaa gcgtaaaagt 1040

<210> 345

<211> 1059

<212> DNA

<213> Streptococcus pneumoniae

<400> 345

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ttctatacag cttttggcag tctgcgtggg attggagaaa tcttccgtgc tatgggtcct 180

09769787 043604

ctggttctga ttggtcttgg ttttgccgtt gccagtcgag ctggtttctt taacgtcgga 240  
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 gatatgcccc gtcccttgat gattctagca accatcgtga ttgccttgat tgctgggtggg 360  
 attgtcggag cgattccagg tattcttagg gcctatctag ggacgtcaga ggttattgta 420  
 accatcatga tgaactacat tgtcttgat gtagggaatg cctttatcca tgctttccct 480  
 aaagaactta tgcaaagtac agattcgacc attcgtgttg gggctaatac aacctatcag 540  
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 tttggcggtc tccaagttgg ggctcctggg atgaatgcgg cgcaggtacc atctgagctt 960  
 gtcagcattg taacagcgtc tattatcttc tttgtcagtg ttcattacct tatcgaacgc 1020  
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<210> 346

<211> 831

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 346

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 agtaaatggg tttacttctt tgcggaaatc attcgtttt tatcgtttga tattagtatc 180  
 ggagtgggga ttattctctt tacggtcttg attcgtacag tcctcttgcc agtctttcag 240  
 gtgcaaatgg tggcttctag gaaaatgcag gaagctcagc cagcattaa ggcgcttcca 300  
 gaacaatatc caggtcgaga tatggaaagc agaaccaaac tagagcagga aatgcgtaaa 360  
 gtattttaaag aaatgggtgt cagacagtca gactctcttt ggccgatttt gattcagatg 420  
 ccggttattt tggccctgtt ccaagcccta tcaagagttg acttttttaa gacaggtcat 480  
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 gtattcacct ttttaagtac ttggttgtcc acaaagctt tgtctgagcg aaatggcgct 600  
 acgactgcga tgatgtatgg gattccagtc ttgattttta tctttgcagt ttatgcgcca 660  
 ggtggagtgc cctatactg gacagtgtct aatgcttato aagtcttgca aacctatttc 720  
 ttgaataatc cattcaagat tatcgcagag cgcgaggccg tagtacaggc acaaaaagat 780  
 ttggaataa gaaaaagaaa agccaagaaa aaggctcaga aaacgaaata a 831

&lt;210&gt; 347

&lt;211&gt; 795

&lt;212&gt; DNA

&lt;213&gt; Streptococcus pneumoniae

&lt;400&gt; 347

atggttatcg atccatttgc tatcaacgaa ctagactatt acttagtttc acacttccac 60  
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 gttaagttta tcggtcotta ccactgtgga cgaatctggg aaggatgggg tgttccaaaa 180  
 gaacgtatca tcgttggtta accaggtgac actatogaat taaaagatat gaagattcat 240  
 gcagtagaat catttgaccg tacttgcttg gtaactctcc cagtgaacgg tgctgatgag 300  
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 aactatatct ttgaaacacc aggtggaacc atctatcatg gtgcagattc tcacttctca 420  
 aactattttg caaaacatgg taaagacttt aaaattgatg ttgctttgaa taactatggg 480  
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 aatctgcgta ccaaagtcac tatcccagtt cactatgata tctgggtctaa cttcatggct 600  
 tctactaatg agattctaga actttggaaa atgcgaaaag atcgcttgca atacgatttc 660  
 catccattta tctgggaagt tggcggttaag tacacttacc ctcaagatca acacttagta 720  
 gaataccatc atccacgtgg ttttgatgat tgttttgaac aagactctaa cattcaattt 780  
 aaagctttgc tataa 795

&lt;210&gt; 348

&lt;211&gt; 585

&lt;212&gt; DNA

&lt;213&gt; Streptococcus pneumoniae

&lt;400&gt; 348

atgttccttt caggctgggt gtctagtttt gctaatactt atatccatga tttactgggg 60  
 gttcttttcc cagatagtcc atttttaaat gcctttgaaa gtgctattgc ggctcctttg 120  
 gtagaagaac ccttgaaatt attgtcactt gtttttgttt tggctttgat tcctgtgcga 180  
 aaattaaaat ctttggtttt acttggaatt gcttcgggtt tgggattcca aatgattaag 240  
 gatattgggtt atattcgtao ggatttgcca gagggctttg actttactat ttcgcgaatt 300  
 ttagagcgta tcattctcagg aattgcctct cactggactt tttcaggtct agctgtagta 360  
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 gaaacagagt tgcttttagc gattccagtg gttacggcta ttgctctcta tggtttttat 540  
 catgcttatt gctttgttga gaaacacaat gagttgatga cctag 585



<210> 349

<211> 390

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 349

atgaagggtgg aaccacgttg cgacgtcctt tcgaggatgt cgcatttttt tattaggata 60  
ctaattatgg agttgcaaga attagtggag cgcagttggg caatccgaca agcttatcac 120  
gaactggaag ttaagcatca tgattccaag tggacggtag aagaagacct cttggcttta 180  
tctaatagata ttggaaattt ccaacgactg gtgatgacaa agcaaggacg ctactatgat 240  
gaaacaccct acacactgga acaaaaaactt tcagaaaata tctggtggct attagaactt 300  
tctcaacggt ttgatataga cattctgacg gaaatggaaa acttcctctc tgataaagaa 360  
aagcaattga acgttaggac ttggaagtag 390

<210> 350

<211> 975

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 350

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tatctgcttt ctttggcatt tcttgcttta ctctttcagt ttttatttgc cagtctagga 120  
atttacttcc tctacttttt cttcttgtgt tgctttgtaa ccatattatt tttcacttgg 180  
gacatattgg tggaaacgca ggtctatcgc caggaacttc tctatggaga gaggggaagcc 240  
aagtctcctt tggaaatagc tttagcagaa aaattagaag cgcgtgagat ggaactctat 300  
cagcagaggt caaaagcaga aagaaaactg acggatttgc tggattacta taccttgttg 360  
gtccatcaga taaagacccc cattgcagcc agtcaactct tagttgcaga agtggtcgac 420  
cgccaactga agcagcagct agaacaggaa attttcaaaa tcgactccta taccaacct 480  
gttttacagt acctgcgctt agaaagtttc catgatgatt tgggtcttaa gcaggttcaa 540  
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ttaaatgtca atctacatga ccttgataaa gaaatcgtga cggataaaaa gtggctgcta 660  
gtggttattg agcaaatcat ctcaaacagt ctcaagtaca ccaaggaagg tggctctggag 720  
atztatatgg atgaccaaga gctttgtatc aaagatacgg gaatcgggat aaaaaacagt 780  
gatgtcctcc gagtatattga acgtggcttt tcaggataca atggccgctt gaccagcag 840  
tctctggac ttggccttta tctatctaag aaaatttctg aagaactggg gcaccagatt 900  
cgtatcgagt ctgaggtcgg aaaaggaacg acagtgcgga ttcagtttgc tcaagtgaac 960

ttagtccttg agtaa

975

&lt;210&gt; 351

&lt;211&gt; 588

&lt;212&gt; DNA

&lt;213&gt; Streptococcus pneumoniae

&lt;400&gt; 351

atggaactta atacacacaa tgctgaaatc ttgctcagtg cagctaataa gtcccactat 60  
 ccgcaggatg aactgccaga gattgcccta gcaggcggtt caaatgttgg taaatccagc 120  
 tttatcaaca ctatgttgaa ccgtaagaat ctgcgccgta catcaggaaa acctggtaaa 180  
 acccagctoc tgaacttttt taacattgat gacaagatgc gctttgtgga tgtgcctggg 240  
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 ccgtcagcag atgatgtgca gatgtacgaa tttctcaagt attatgagat tccagtcac 420  
 attgtggcga ccaaggcgga caagattcct cgtggtaaat ggaacaagca tgaatcagca 480  
 atcaaaaaga aattaaactt tgacccgagt gacgatttca tctcttttc atctgtcagt 540  
 aaggcagga tggatgaggc ttgggatgca atcttagaaa aattgtga 588

&lt;210&gt; 352

&lt;211&gt; 891

&lt;212&gt; DNA

&lt;213&gt; Streptococcus pneumoniae

&lt;400&gt; 352

atgacaaaga aacaacttca cttggtgatt gtgacaggga tgagtggcgc agggaaaact 60  
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 ctottgccta agtttttgca gctggttgaa attaaggaag acaatcctaa gttggccttg 180  
 gtagtgata tgcgtagccg ttctttcttt tcagagattc aagctgtttt ggatgagttg 240  
 gaaaatcaag atggtttgga tttcaaaatc ctcttttttg atgcggctga taaggaaattg 300  
 gtgcgtcgtt acaaggaaac cagacggagt caccactag cagcagacgg tcgtatttta 360  
 gatggaatca agttggaacg tgaactcttg gcacctttga aaaatatgag ccaaatgtg 420  
 gtggatacga ctgaactcac tccacgtgag ctgcgcaaaa cocttgacga gcagttttca 480  
 gaccaagaac aagcccagtc tttccgtatc gaagtcattgt ctttcggatt taagtatgga 540  
 atcccgattg atgcggactt ggtctttgat gtccgtttct tgccaaatcc ctattattta 600  
 ccagaactga gaaaccaaac ggggtgtggat gaacctgttt atgattatgt catgaaccat 660

P03630.01504

cctgagtcag aagactttta tcaacattta ttggccttga ttgagccgat tctgccaaagt 720  
 taccaaaaagg aaggtaagtc cgttttgacc attgccatgg gatgtacggg tggacaacac 780  
 cgtagtgtgg catttgctaa acgcttggcg caggacttat ccaagaattg gtctgttaat 840  
 gaagggcatc gcgacaaaga ccgcagaaag gaaacggtaa accgttcattg a 891

<210> 353

<211> 978

<212> DNA

<213> Streptococcus pneumoniae

<400> 353

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 tcttcaggtg aactccgaaa aaatatgcaa cagttgacac cgccaggtga tcttcgtaat 180  
 gtccttgtgg ccatgtcgga tatgcctaag ttttatgaga aggtctttca gtatcggttc 240  
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 tcagaaatgc agggttcaac ctataatgcc atgcagttat tgagcaaatt tttccataca 360  
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 gggacagaag tggctggaga gtagcatatt gtagaccatc gaggcataat tgacaatgtc 480  
 tatgtgacca atgccctaaa cgatgatacg cctctggcca gccgtcgagt agtgcagacc 540  
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 aatatcgtga ttaaggaaat tgggcgggct cttttggaaa ccaaggcaga aattgcctat 660  
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 gaagtcttgc atcgtcacct tggtcgccct tttatcgaca ctgtcttggt gaatattgaa 780  
 aaagtgcctc aggaatacat gaattccaac cgttttgatg aatacttagt gcaagtggaa 840  
 cacgattttg taggtctttg taagcaagtt tcgcgcgtga tttcatctaa cttccttcgt 900  
 ctggaaaatg gcggtgcctt ccacgatgga gatttgattg tggacgagtt gatgcgcatt 960  
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<210> 354

<211> 1179

<212> DNA

<213> Streptococcus pneumoniae

<400> 354

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 atatttattg cagtaaatta tctaccggat ttgttactaa tcttttttgg accagttatt 180  
 gacagagtaa atccgcaaaa aattccttata atatcaattt tgggtcaatt agcagtggct 240  
 gtaatatattt tattattatt aaaccaaata tcatttttggg tgataatgag tctagtgttt 300  
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 gtagaatatg ataagattgt atttgcaaatt tctcttttta gtatttcgta taaagtatta 420  
 gattctattt ttaattcatt cgcattcattt ttacaggtgg cagtaggatt tattttattg 480  
 gttaagatag atataggcat atttttactt gctctattta tattgttggt gttaaaattt 540  
 agaactagca atgcgaatat agaaaacttc tctttcaaat attacaagag agaagtgttg 600  
 caaggtacaa agttttattt aaataataaa ttattattta aaaccagtat ttctttaacg 660  
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 tcacttattt tatttttctg ttgttttatg tctaaaggag tcttcaatat tatttttaat 960  
 tcgttgtagc aacaaatacc tccacatcaa cttcttggtg gggtaaatac taccattgat 1020  
 tctattattt cttttggaat gccatttgt agtttagttg caggaacgct tattgatttg 1080  
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<210> 355

<211> 678

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 355

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 gtttatgtag ttttagctct atatggctcc ttcttggtca aggatagatt gatccaacaa 180  
 tggaaggaga ttagaaagac taaaagaaaa ttcttctttg gagtcttaac aggatggctc 240  
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 ctactgatag ctgtttttgc ttgtgtcatt ggacctctgg tagaagaatt atttttccgt 420  
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 ggacttggtt ttgctctgac tcatatgcac agtttggtc tatcagagtg gattgggtgca 540  
 gttgggttact taggtggagg ccttgctttt tctattattt atgtgaaaga aaaagagaat 600  
 atctactatc ccctacttgt tcacatgtta agcaacagcc tctccttaat catttttagct 660

atcagtatag taaaatga

678

<210> 356

<211> 1158

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 356

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gcatctgggt cggggaaatc aactatccta aacattattg caggtttact ggatgacgac 180  
acaggagata tcatgctaga cgggtgttcgt atcaatgata ttccaaccaa caagcgcgac 240  
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cgtgaattac aacaacgatt gggcattacc tttgtctttg tcactcagca tcaggaagaa 600  
gctcttgcca tgagtactg gattttcgtt atgaatgatg gcgagattgt ccagtctgga 660  
accctgtgg acatctacga tgagccaatc aaccactttg ttgccacctt tatcggggag 720  
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gacatccaca tcatgcgtct caatgaaacc gaagaagagt tcgatgctcg tattgaggag 1080  
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gaagaaaaca agctctaa 1158

<210> 357

<211> 621

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 357

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0076970101501

ttccatagga aggaatgcat cttgtccttt aaacaaagta cagctttttt catcggaagc 120  
 atggtttttcg ttccaggaat ctgtgctgga gtaaattatc ttatatcccg taagcaagaa 180  
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 cagcaagaat tagttgactt ttatttgcca tccttctttt tcctatttgg gctagatttg 360  
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 aagacagtgt tggtgactat tttagcaaca cttcttttct taagaaatcc aatgaccatt 480  
 gtctcacttc tgatttatat tggactgggc ttgttttttg cagcctatct tgtcccaaat 540  
 tcggttaaga aggaagtttc cttttatggt catattttcc gagatcttgt attggtcatt 600  
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<210> 358

<211> 1017

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 358

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 ggagtggaca ccggaatgt tgaacgaact gaaacttggg tcggtagaag tgatagcatg 240  
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 cctaacttgc taggctataa agattcattt aaaaccattg aaactcagca gttgcagggt 840  
 gaaggagaga tacttcaagg tgtttcttac cagattgttt cgagagcaca tatgttggaa 900  
 atgcaaaatc tactccgacg ttctttggga caagaagaag ttactcagct tgaaaccaat 960  
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&lt;210&gt; 359

&lt;211&gt; 996

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 359

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 aaaacagaaa aatttgtctt tttattgttg gttttcagca tgtccatgac ctgtctctta 180  
 gccctgtttt ggcgagggat cgaagagctt tctctaagaa aaatgcaggc taatctcaag 240  
 cgtttattag cagggcaaga agtggttcag gttgcagatc cagatttgga tgccagtttc 300  
 aagtccttat caggtaaaact taaccttttg acagaggctc ttcaaaaagc tgaaaatcag 360  
 agccttgctc aggaagagga aatcatcgag aaggaacgga agcgaattgc tcgggatttg 420  
 cacgatacag tcagtcagga gttgtttgcg gccacatga ttttatcggg tatcagtcag 480  
 caggctttga aattggatag agaaaagatg cagaccaggt tgcagagtgt cacagctatt 540  
 ttagaaaacag cccagaagga tttgcgggtt ttgctcttgc atttgcgacc agttgaactg 600  
 gagcagaaga gcttgataga agggattcaa attcttttaa aagagcttga ggacaagagt 660  
 gatcttaggg ttagtctcaa gcagaatatg acgaaattgc ctaagaaaat cgaggagcat 720  
 atcttccgta tcttgcaaga gttgattagc aataccctcc gccatgccca ggcatcttgc 780  
 ctagatgtct acctctatca gacagatgtt gaattgcaac tgaagggtgt ggacaatggg 840  
 attggtttcc agttagggag cttagacgac ttgagttatg gactgcgaaa tatcaaggag 900  
 cgggttgaag atatggctgg aacagttcaa ctcttgacag ctccaagca agggctggcg 960  
 gttgatattc gtattcccct gttagataag gaatga 996

&lt;210&gt; 360

&lt;211&gt; 867

&lt;212&gt; DNA

<213> *Streptococcus pneumoniae*

&lt;400&gt; 360

atgattgttt ccattatttc tcaaggattt gtctgggcta ttctaggtct gggaatcttt 60  
 atgacattta ggattttaaa ctttccagat atgacgacag aaggttcctt cctctttggg 120  
 ggagctgttg ctgtcacttt gataaccaa ggcgtgaacc catttttagc gacacttggt 180  
 gctgtaggag caggttggtt ggctggaatg gcagcaggcc ttctttatac aaaaggaag 240  
 atcccaacct tgctctcagg gattttggtg atgacttctt gtcactcaat catgctcttg 300  
 attatgggac gtgcgaattt aggcctgctt ggaaccaagc aaattcagga tgttttgcct 360  
 tttgattcgg atttgaatca actcttgaca ggtctcatct ttgtgagtat tgttattgct 420

ctcatgctct ttttcttgga cactaaactc ggacaagcct atattgctac aggggataat 480  
 cctgatatgg ctagaagttt cgggattcat actggacgca tggagctcat gggcttggtc 540  
 ttatcaaagtg gtgtgattgc ccttgcaggt gccctcattg ctcagcaaga aggttatgcc 600  
 gatgtgtctc gagggatcgg gggttatcgtt gtggggcttg caagtttgat tattggagaa 660  
 gttattttca agagtttgag cttggcagag cgtttggtta ctatcgttgt aggttctatc 720  
 gcttatcaat ttttagtggt ggcagttatc gcacttggtt ttaatacaag ttaccttcgt 780  
 ttatacagtg ccttgatttt agcagtcctgc ctcatgattc caacatttaa gcaaacaatc 840  
 ttgaaaggag ccaagttaag caaatga 867

<210> 361

<211> 1068

<212> DNA

<213> Streptococcus pneumoniae

<400> 361

atgaaaaaaaa tgaaagtttg gtctactgta cttgcaacgg gagttgctct tactacactt 60  
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 aaaagtcaag aattagttat ctattcgaac tcagtcctcaa atggctcgtgg tgattgggtta 180  
 actgctaaaag caaaagaagc tgggttttaaat ataaaaatgg ttgatatcgc tggcgctcaa 240  
 ttagcagacc gtgttattgc tgagaagaat aatgcagttg cagatatggt atttggaatt 300  
 ggtgctggtt attcaaataa aattagagat caaaaattac tagtacagta caagcctaaa 360  
 tgggttagata aaattgatca atcttttatca gataaagata attattataa tcctgtgatt 420  
 gttcaaccat tagtttttaat tggggcgccct gatgtaaaag aaatgcctaa agattggact 480  
 gaattaggta gtaagtataa aggtaaatat tcaatttctg gtcttcaagg aggtacagga 540  
 cgggcaattc tagcaagtat cttagttcga taccttgatg ataaaggatga attaggtgtt 600  
 tccgaaaaag gttgggaagt agcaaaagaa ttttgaaaa atgcatacac tcttcaaaag 660  
 ggagaaagtt caattgttaa gatgttagac aaagaagatc caatacaata tggaatgatg 720  
 tgggggttctg gtgcattagt tggacaaaaa gaacaaaatg ttgttttcaa agttatgact 780  
 cctgagattg gtgtaccatt tgtaactgaa caaactatgg ttttaagcac tagtaaaaaa 840  
 caagcgttag ctaaagaatt tattgattgg tttggtcaat cagaaattca agtagaatat 900  
 agtaagaact ttggatctat tcctgcaaat aaagatgccc tcaaagatct acctgaagat 960  
 acgaagaaat ttgttgatca agtgaaacca caaaatattg actgggaagc tgttggaaag 1020  
 catttgatg aatgggtaga aaaagctgaa ttagaatacg tacaataa 1068



<210> 362

<211> 1011

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 362

atgattaaat ttgataatat tcaaattaaa tatggtgatt ttgttgcaat tgataatctg 60  
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tcaactactt tgagagcatt ggtaggtttt ctagatccat catcaggaag tattgaagtt 180  
aatggaacag atgtcactca tttggaacct gaaaagcgtg gaattggtat tgtatttcaa 240  
tcttatgccc tatttccaac tatgactgtt tttgataata ttgcatttgg tttaaaagtt 300  
aagaaggtag ctccagatgt tattaaagct aaagtatcag cagtggcagc aaaaattaag 360  
atctctgata aacagttaca gcgtaatgta tcagaattat ctgggggtca acaacaagg 420  
gtagcattgg ctctgtctct ggttcttgaa cctaaaattc tttgtctaga tgaaccattg 480  
tcaaaccttg acgcaaaatt acgtgtagat ttgagaaaag agttgaaaag acttcaaaaa 540  
gagttaggta ttactacttt atatgttact catgatcaag aggaagcctt gactttatct 600  
gatagaattg cagtctttaa caatggatac atcgaacagg tcggtacacc agtagagatt 660  
tatcataatt ctcaaactga atttgtatgt gattttattg gagatattaa tgttttgacc 720  
gatgaaacag tccacgaagt attattgaaa aatacaagcg ttttcttaga ggataaaaaa 780  
ggatacattc gattagagaa agttcgattc aatcgtgaaa ctgaacaaga ttttattcta 840  
aaagggacaa ttattgatgt tgagttttct ggagttacaa ttcactatac aataaaagtt 900  
tctgaaagtc agattcttaa tgtaacaagt attgatagtc aggctgctat tagatctgtc 960  
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<210> 363

<211> 1692

<212> DNA

<213> *Streptococcus pneumoniae*

<400> 363

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gtaacattta ttatttatcc aaactttgat ctagtagtga atgtatttgt aaaaggagga 120  
gaattttccc ttgatgctgt acatcgtgtt ctaaaatctc agagggcaat tcagagtatt 180  
atgaacagtt ttaagttagc attttcactc attattacag ttaatgtcgt aggtattctt 240  
tgtgttctat ttacagagta ctttgatatt aaaggtgcta aaattttaaa attaggttat 300  
atgacctctt taatttatgg aggagtgggt ttagcgactg gatataaatt tgtctatgg 360  
ccttatggat tgattacaaa atttttacaa aatgttatcc cttctttaga ccctaactgg 420

tttattgggt atggtgcagt cttattcatt atgacatttt caggaactgc taatcataca 480  
 ttgttttttaa caaatacaat tcgaagcggt gactatcaca ctattgaggc tgctcgaaat 540  
 atgggagcaa aaccatttac tgttttcoga aaagtagtgt taccaacctt aattccaact 600  
 ctatttgcac ttactattat ggtttttott agtggtttat ctgcagtagc agcaccatg 660  
 attgttggtg gtaaagaatt tcaaactata aatccaatga ttattacatt tgcagggatg 720  
 gggaattctc gtgatttagc tgccctactt gcaattatth taggtattgc aactacaatt 780  
 ttgcttacta tcatgaataa gatagaaaaa ggtggaaatt atatttctat ctctaagact 840  
 aaagcgctc ttaaaaaaca aaaaattgcg tctaagcctt ggaatatcat tgcacacatt 900  
 gtagcatatg gattgttcac agttttcatg cttccactaa tttttatagt attatactca 960  
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 tattotatta ttgctgcgac aacagcaaca attctcgcag ttgtatttgc tcgtgttgtc 1140  
 agaaaacata aatctcgttt tgattttotta tttgaatatg gtgctctact tccttggtta 1200  
 ctaccaagta cacttttagc agtaagttha ttatttactt ttaatcagcc acaatttctt 1260  
 gtcttgaatc agattttggt aggtagtttg gtaattctac ttattgcata tatagttgta 1320  
 aaaatcccat tttcttatag aatggtacgt gctattttat ttagtggtga tgatgagatg 1380  
 gaagatgcag caagaagtat ggggtgctca cctttttata ctatgatgaa gggtatcatt 1440  
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 gacttcgact tatctgtatt cttttaccat cccctagctc aaccattagg tattacgatt 1560  
 cgatctgcag gtgatgaaac agcaacatct aatgcacaag ctctggtatt tgtttataca 1620  
 attgttctga tgattatttc tggaacggta ttatacttca cacaagacc ggggcgtaaa 1680  
 gtaaggaaat aa 1692

<210> 364

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<221> SITE

<222> (3)

<223> Xaa=any amino acid

<220>

<223> Description of Artificial Sequence: Cell wall  
 anchoring motif

<400> 364

Leu Pro Xaa Thr Gly

1

5

<210> 365

<211> 18

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 365

gcgggatccg ccaccatg

18

<210> 366

<211> 10

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 366

ttgcgggcgc

10

<210> 367

<211> 38

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 367

cggatccgcc accatgtctt ctaatgaatc tgccgatg

38

<210> 368

<211> 39

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 368

ttggggccgc ctgttttagat tggatatctg taaagactt

39

<210> 369

<211> 40

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 369

cgcggatccg ccaccatgga ttttcottca aatttgagg

40

<210> 370

<211> 29

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 370

ttggggccgc accgtactgg ctgctgact

29

<211> 39

<213> Artificial Sequence

<223> Description of Artificial Sequence: Primer

cggatccgcc accatgagtg agatcaaaat tattaacgc

39

<211> 29

<213> Artificial Sequence

<223> Description of Artificial Sequence: Primer

ttgcggccgc cgttccatgg ttgactcct

29

<211> 38

<213> Artificial Sequence

<223> Description of Artificial Sequence: Primer

cgcggatccg ccaccatgtg ggacatattg gtggaaac

38

<211> 32

<213> Artificial Sequence

<223> Description of Artificial Sequence: Primer

ttgcggccgc ttcaacttgag caaactgaat cc

32

<211> 42

<213> Artificial Sequence

<223> Description of Artificial Sequence: Primer

cgcggatccg ccaccatgtc acaagaaaaa acaaaaaaatg aa

42

<211> 28

<213> Artificial Sequence

<223> Description of Artificial Sequence: Primer

ttgcggccgc atcgacgtag tctccgcc

28

<210> 377

<211> 43

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 377

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43

<210> 378

<211> 29

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 378

ttgcggccgc aactttcgtc cctttttgg

29

<210> 379

<211> 34

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 379

cgcggatccg ccaccatggg caattctggc ggaa

34

0076939 01301

<210> 380

<211> 35

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 380

ttgcggccgc ttgtttcata gcttttttga ttgtt

35

<210> 381

<211> 39

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 381

cgcggtatccg ccaccatgct attgatacga aatgcaggg

39

<210> 382

<211> 37

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 382

ttgcggccgc aacataatct agtaaataag cgtagcc

37

0936939-04364  
T036T0-09269260



<210> 383

<211> 34

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 383

cgcggatccg ccaccatgac ggcgacgaat tttc

34

<210> 384

<211> 35

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 384

ttgcggccgc ttaattcgtt tttgaactag ttgct

35

<210> 385

<211> 40

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

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40

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<210> 386

<211> 34

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 386

ttgcggccgc tttcttcaac aaaccttggt cttg

34

<210> 387

<211> 39

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 387

cgcggtatccg ccaccatggg taaccgtctt tctcgtaac

39

<210> 388

<211> 31

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 388

ttgcggccgc gcttccatca aggatttttag c

31

00759787 012604  
1052710 28269260